Salton Sea

SPECIES CONSERVATION HABITAT PROJECT

Draft Environmental Impact Statement/Environmental Impact Report

U.S. Army Corps of Engineers Application No. SPL-2010-00142-LLC

State Clearinghouse No. 2010061062

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CALIFORNIA natural resources AGENCY

PREPARED FOR

The California Natural Resources Agency by the Department of Water Resources and Department of Fish and Game

Salton Sea Species Conservation Habitat Project
Draft Environmental Impact Statement/Environmental Impact Report

U.S. Army Corps of Engineers
California Natural Resources Agency

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Table of Contents

Executive Summary **ES-1**

ES1.1 Introduction ES-1

ES1.2 Project Location ES-1

ES1.3 CEQA Project Goals and Objectives / NEPA Purpose and Need ES-1

ES1.4 Draft Section 404(b)(1) Alternatives Analysis Basis and Overall Project Purpose ES-3

ES1.5 Species Supported by the Species Conservation Habitat Project ES-3

ES1.5.1 Aquatic Species ES-3

ES1.5.2 Piscivorous Birds ES-4

ES1.6 Environmental Review Process ES-4

ES1.7 Purpose of the EIS/EIR ES-5

ES1.7.1 NEPA and the Purpose of an EIS ES-5

ES1.7.2 CEQA and the Purpose of an EIR ES-5

ES1.8 Intended Uses of the Draft EIS/EIR ES-5

ES1.8.1 Corps' Use of the EIS/EIR ES-5

ES1.8.2 Natural Resources Agency's Use of the EIS/EIR ES-6

ES1.8.3 Cooperating, Responsible, and Trustee Agency Actions ES-6

ES1.9 Required Permits and Consultations ES-6

ES1.10 Scope and Contents of the Draft EIS/EIR ES-7

ES1.11 Alternatives Considered in the Draft EIS/EIR ES-8

ES1.12 Summary of Impacts ES-9

ES1.13 Comparative Impacts of the Project Alternatives ES-19

ES1.14 Environmentally Preferable/Environmentally Superior Alternative ES-20

ES1.15 Preferred Alternative ES-21

ES1.16 Areas of Known Controversy ES-21

ES1.17 Issues to Be Resolved ES-22

SECTION 1 Introduction **1-1**

1.1 Project Location 1-1

1.2 Background 1-1

1.3 CEQA Project Goals and Objectives / NEPA Purpose and Need 1-3

1.4 Draft Section 404(b)(1) Alternatives Analysis Basis and Overall Project Purpose 1-6

1.5 Species Supported by the Species Conservation Habitat Project 1-6

1.5.1 Aquatic Species 1-6

1.5.2 Piscivorous Birds 1-7
1.6 Development of the Salton Sea Species Conservation Habitat Project 1-8
1.6.1 Salton Sea Restoration Program 1-8
1.6.2 Bureau of Reclamation Restoration of the Salton Sea 1-9
1.6.3 U.S. Geological Survey/Reclamation Saline Habitat Ponds 1-9
1.6.4 Torres Martinez Ponds 1-9
1.6.5 Species Conservation Habitat Project's Relationship to Other Projects 1-10
1.7 Environmental Review Process 1-10
1.8 Purpose of the EIS/EIR 1-10
1.8.1 NEPA and the Purpose of an EIS 1-10
1.8.2 CEQA and the Purpose of an EIR 1-11
1.9 Intended Uses of the Draft EIS/EIR 1-11
1.9.1 Corps' Use of the EIS/EIR 1-11
1.9.2 Natural Resources Agency's Use of the EIS/EIR 1-11
1.9.3 Cooperating, Responsible, and Trustee Agency Actions 1-11
1.10 Required Permits and Consultations 1-12
1.11 Document Organization 1-12
1.12 Scope and Contents of the Draft EIS/EIR 1-14
1.13 References 1-16
1.14 Personal Communications 1-17

SECTION 2 Alternatives 2-1

2.1 Regulatory Requirements 2-1
2.2 Alternatives Development 2-2
2.2.1 Exclusionary Criteria 2-3
2.2.2 Evaluative Criteria 2-5
2.3 No Action Alternative 2-7
2.3.1 Actions that Could Affect Inflows to the Salton Sea 2-7
2.3.2 Facilities Included in No Action Alternative 2-9
2.4 Features Common to the Project Alternatives Carried Forward for Detailed Analysis 2-10
2.4.1 Project Components 2-11
2.4.2 Construction 2-23
2.4.3 Operations 2-25
2.4.4 Monitoring and Adaptive Management 2-26
2.4.5 Mosquito Control 2-26
2.4.6 Maintenance and Emergency Repairs 2-27

2.4.7 Best Management Practices 2-27
2.4.8 Decommissioning 2-28
2.5 Alternative 1 – New River, Gravity Diversion + Cascading Ponds....2-28
2.6 Alternative 2 – New River, Pumped Diversion 2-33
2.7 Alternative 3 – New River, Pumped Diversion + Cascading Ponds....2-37
2.8 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond....2-41
2.9 Alternative 5 – Alamo River, Pumped Diversion 2-45
2.10 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds 2-49
2.11 References....2-53
2.12 Personal Communications 2-53

SECTION 3 Affected Environment, Impacts, and Mitigation Measures....3-1

3.0 Introduction....3-1
3.0.1 Key Principles Guiding Preparation of this Draft Environmental Impact Statement/Environmental Impact Report....3-1
3.0.2 CEQA and NEPA Baselines 3-2
3.0.3 Duty to Mitigate....3-3
3.0.4 Structure of Resource Sections 3-3
3.0.5 Terminology Used in the Environmental Impact Analysis....3-5
3.0.6 References....3-6
3.1 Aesthetics....3.1-1
3.1.1 Introduction....3.1-1
3.1.2 Regulatory Requirements....3.1-1
3.1.3 Affected Environment....3.1-2
3.1.4 Impacts and Mitigation Measures....3.1-7
3.1.5 References....3.1-14
3.1.6 Personal Communications 3.1-14
3.2 Agricultural Resources 3.2-1
3.2.1 Introduction....3.2-1
3.2.2 Regulatory Requirements....3.2-2
3.2.3 Affected Environment....3.2-4
3.2.4 Impacts and Mitigation Measures....3.2-6
3.2.5 References....3.2-11
3.2.6 Personal Communications 3.2-11
3.3 Air Quality....3.3-1
3.3.1 Introduction....3.3-1
3.3.2 Regulatory Setting 3.3-2

3.3.3 Affected Environment 3.3-8
3.3.4 Impacts and Mitigation Measures 3.3-20
3.3.5 General Conformity 3.3-39
3.3.6 References 3.3-45
3.3.7 Personal Communications 3.3-47
3.4 Biological Resources 3.4-1
3.4.1 Introduction 3.4-1
3.4.2 Regulatory Requirements 3.4-3
3.4.3 Affected Environment 3.4-5
3.4.4 Impacts and Mitigation Measures 3.4-29
3.4.5 References 3.4-72
3.4.6 Personal Communications 3.4-77
3.4.7 Acronyms 3.4-78
3.5 Cultural Resources 3.5-1
3.5.1 Introduction 3.5-1
3.5.2 Regulatory Requirements 3.5-1
3.5.3 Affected Environment 3.5-6
3.5.4 Impacts and Mitigation Measures 3.5-10
3.5.5 References 3.5-12
3.5.6 Personal Communications 3.5-14
3.6 Energy Consumption 3.6-1
3.6.1 Introduction 3.6-1
3.6.2 Regulatory Requirements 3.6-1
3.6.3 Affected Environment 3.6-2
3.6.4 Impacts and Mitigation Measures 3.6-4
3.6.5 References 3.6-7
3.7 Environmental Justice 3.7-1
3.7.1 Introduction 3.7-1
3.7.2 Regulatory Requirements 3.7-2
3.7.3 Affected Environment 3.7-3
3.7.4 Impacts and Mitigation Measures 3.7-4
3.7.5 References 3.7-8
3.8 Geology, Soils, and Minerals 3.8-1
3.8.1 Introduction 3.8-1
3.8.2 Regulatory Requirements 3.8-1
3.8.3 Affected Environment 3.8-3

3.8.4 Impacts and Mitigation Measures 3.8-11
3.8.5 References 3.8-16
3.8.6 Personal Communications 3.8-17
3.9 Greenhouse Gas Emissions/Climate Change 3.9-1
3.9.1 Introduction 3.9-1
3.9.2 Regulatory Requirements 3.9-2
3.9.3 Affected Environment 3.9-9
3.9.4 Impacts and Mitigation Measures 3.9-10
3.9.5 References 3.9-16
3.10 Hazards and Hazardous Materials 3.10-1
3.10.1 Introduction 3.10-1
3.10.2 Regulatory Requirements 3.10-2
3.10.3 Affected Environment 3.10-4
3.10.4 Impacts and Mitigation Measures 3.10-12
3.10.5 References 3.10-24
3.10.6 Personal Communications 3.10-24
3.11 Hydrology and Water Quality 3.11-1
3.11.1 Introduction 3.11-1
3.11.2 Regulatory Requirements 3.11-3
3.11.3 Impacts and Mitigation Measures 3.11-21
3.11.4 References 3.11-48
3.11.5 Personal Communications 3.11-48
3.12 Indian Trust Assets 3.12-1
3.12.1 Personal Communications 3.12-1
3.13 Land Use 3.13-1
3.13.1 Introduction 3.13-1
3.13.2 Regulatory Requirements 3.13-1
3.13.3 Affected Environment 3.13-4
3.13.4 Impacts and Mitigation Measures 3.13-10
3.13.5 References 3.13-18
3.13.6 Personal Communications 3.13-18
3.14 Noise 3.14-1
3.14.1 Introduction 3.14-1
3.14.2 Regulatory Requirements 3.14-3
3.14.3 Affected Environment 3.14-5
3.14.4 Impacts and Mitigation Measures 3.14-6

3.14.5 References 3.14-16
3.15 Paleontological Resources 3.15-1
3.15.1 Regulatory Requirements 3.15-2
3.15.2 Affected Environment 3.15-3
3.15.3 Impacts and Mitigation Measures 3.15-5
3.15.4 References 3.15-8
3.16 Population and Housing 3.16-1
3.16.1 Introduction 3.16-1
3.16.2 Regulatory Requirements 3.16-1
3.16.3 Affected Environment 3.16-1
3.16.4 Impacts and Mitigation Measures 3.16-2
3.16.5 References 3.16-5
3.17 Public Services 3.17-1
3.17.1 Introduction 3.17-1
3.17.2 Regulatory Requirements 3.17-1
3.17.3 Affected Environment 3.17-1
3.17.4 Impacts and Mitigation Measures 3.17-2
3.17.5 References 3.17-4
3.17.6 Personal Communications 3.17-4
3.18 Recreation 3.18-1
3.18.1 Regulatory Requirements 3.18-1
3.18.2 Affected Environment 3.18-1
3.18.3 Impacts and Mitigation Measures 3.18-4
3.18.4 References 3.18-6
3.18.5 Personal Communications 3.18-6
3.19 Socioeconomics 3.19-1
3.19.1 Regulatory Requirements 3.19-2
3.19.2 Affected Environment 3.19-2
3.19.3 Impacts and Mitigation Measures 3.19-6
3.19.4 References 3.19-15
3.19.5 Personal Communications 3.19-16
3.20 Transportation and Traffic 3.20-1
3.20.1 Regulatory Requirements 3.20-3
3.20.2 Affected Environment 3.20-5
3.20.3 Impacts and Mitigation Measures 3.20-11
3.20.4 References 3.20-16

3.20.5 Personal Communications 3.20-16
3.21 Utilities and Service Systems....3.21-1
3.21.1 Regulatory Requirements....3.21-1
3.21.2 Affected Environment....3.21-3
3.21.3 Impacts and Mitigation Measures....3.21-4
3.21.4 References....3.21-8
3.21.5 Personal Communications 3.21-8

SECTION 4 CUMULATIVE IMPACTS 4-1
4.1 Cumulative Impact Methodology 4-1
4.2 Analysis of Cumulative Impacts by Project....4-2
4.2.1 United States Army Corps of Engineers Section 404 Permit Projects....4-2
4.2.2 Allied Imperial Landfill Expansion Project....4-4
4.2.3 Black Rock 1, 2, and 3 Geothermal Power Project....4-4
4.2.4 Chocolate Mountains Solar Farm 4-5
4.2.5 Desert Springs Resort Specific Plan 4-6
4.2.6 East Brawley Geothermal Development Project 4-6
4.2.7 Imperial Solar Energy Center South....4-7
4.2.8 Imperial Solar Energy Center West 4-8
4.2.9 Imperial Valley Solar Company 1 Photovoltaic Solar Facility....4-9
4.2.10 Imperial Valley Solar, LLC Project and Amendment to the California Desert Conservation Area Land Use Management Plan 4-10
4.2.11 Metropolitan Water District of Southern California's New and Alamo Rivers Water Rights Applications....4-11
4.2.12 Seeley County Wastewater Treatment Plant Upgrade Project....4-11
4.2.13 Travertine Point Specific Plan 4-12
4.2.14 Truckhaven Geothermal Leasing Area 4-13
4.2.15 West Chocolate Mountains Renewable Energy Evaluation Area....4-14
4.2.16 Summary of Cumulative Project Impacts 4-14
4.3 Analysis of Cumulative Impacts by Resource 4-17
4.3.1 Aesthetics....4-17
4.3.2 Agricultural Resources....4-17
4.3.3 Air Quality 4-17
4.3.4 Biological Resources 4-18
4.3.5 Cultural Resources....4-18
4.3.6 Energy Consumption 4-18
4.3.7 Environmental Justice....4-19

4.3.8 Geology and Soils 4-19
4.3.9 Greenhouse Gas Emissions/Climate Change 4-19
4.3.10 Hazards and Hazardous Materials 4-20
4.3.11 Hydrology and Water Quality 4-20
4.3.12 Indian Trust Assets 4-21
4.3.13 Land Use 4-21
4.3.14 Noise 4-21
4.3.15 Paleontological Resources 4-21
4.3.16 Population and Housing 4-21
4.3.17 Public Services 4-22
4.3.18 Recreation 4-22
4.3.19 Socioeconomics 4-22
4.3.20 Transportation 4-23
4.3.21 Utilities and Service Systems 4-23
4.3.22 References 4-24
4.3.23 Personal Communications 4-24

SECTION 5 Other Sections Required by NEPA and/or CEQA 5-1

5.1 Growth-Inducing Impacts 5-1
5.2 Relationship between Short-Term Uses and Long-Term Productivity 5-2
5.3 Irreversible and Irretrievable Commitments of Resources 5-3
5.4 Unavoidable Significant Impacts 5-4

SECTION 6 Compliance, Consultation, and Coordination 6-1

6.1 Regulatory Compliance 6-1
6.1.1 Federal Laws, Regulations, and Executive Orders 6-1
6.1.2 State of California Laws and Regulations 6-8
6.2 Consultation and Coordination 6-10
6.2.1 Public Involvement 6-11
6.2.2 Federal, State, and Local Agency Consultation and Coordination 6-12
6.2.3 Tribal Consultation and Coordination 6-13
6.2.4 Elected Officials Consultation and Coordination 6-13

SECTION 7 Summary Comparison of Alternatives 7-1

7.1 Introduction 7-1
7.2 Comparative Impacts of the Project Alternatives 7-1
7.3 Environmentally Preferable/Environmentally Superior Alternative 7-3
7.4 Preferred Alternative 7-4

SECTION 8 Acronyms and Glossary of Terms 8-1

8.1 Acronyms 8-1

8.2 Glossary of Terms 8-8

SECTION 9 List of Preparers 9-1

9.1 Agency Personnel 9-1

9.2 Cardno ENTRIX 9-2

9.3 Dudek 9-3

9.4 Ducks Unlimited 9-4

9.5 Chambers Group 9-4

9.6 University of California at Riverside 9-4

9.7 Davis Group 9-4

Appendices

Appendix A Scoping Process

Appendix B Alternatives Development Process

Appendix C Geotechnical Investigations

Appendix D Project Operations

Appendix E Monitoring and Adaptive Management Framework

Appendix F Mosquito Control Plan

Appendix G Air Quality Documentation

Appendix H Special-Status Species Evaluated but not Affected by the SCH Project

Appendix I Selenium Management Strategies

Appendix J Summary of Special Studies Supporting the EIS/EIR Impact Analysis

Appendix K Corps Section 404 Permit Projects in the HUC 8 Watershed

Appendix L Tribal Consultation and Coordination

Tables

Table 1-1 Focal Species of Piscivorous Birds that Would Be Served by the Species Conservation Habitat Project 1-7

Table 3.1-1 Summary of Impacts on Aesthetics 3.1-1

Table 3.2-1 Summary of Impacts on Agricultural Resources 3.2-1

Table 3.2-2 New River Farmland Categories 3.2-5

Table 3.2-3 Alamo River Farmland Categories 3.2-5

Table 3.2-4 Fallowed Land in the IID Service Area, 2002-2009 ..... 3.2-9

Table 3.3-1 Summary of Impacts on Air Quality 3.3-1

Table 3.3-2 Ambient Air Quality Standards 3.3-3
Table 3.3-3 Meteorological Data for the Imperial/Coachella Valley Region (September 2009 – October 2010) 3.3-8
Table 3.3-4 Salton Sea Air Basin Ozone Exceedances (2000 to 2009) 3.3-14
Table 3.3-5 Salton Sea Air Basin PM_{10} Exceedances (2000 to 2009) 3.3-15
Table 3.3-6 Salton Sea Air Basin $PM_{2.5}$ Exceedances (2000 to 2009) 3.3-15
Table 3.3-7 Federal and California Air Quality Attainment Status Designations for the Salton Sea Air Basin 3.3-16
Table 3.3-8 Estimated 2008 Regional Emissions Inventory Annual Average Daily Emissions Rates for All Sources in Salton Sea Air Basin 3.3-18
Table 3.3-9 Estimated 2008 Annual Average Daily PM_{10} Emissions in the Salton Sea Air Basin 3.3-19
Table 3.3-10 Emissions Significance Thresholds - Salton Sea Air Basin Nonattainment Area 3.3-21
Table 3.3-11 Emissions Significance Thresholds - General Conformity 3.3-21
Table 3.3-12 Estimated Maximum Daily Construction Emissions for Project Alternatives (with Required Controls) 3.3-30
Table 3.3-13 Estimated Maximum Daily Construction Fugitive Dust Emissions for Project Alternatives (with Required Controls) 3.3-31
Table 3.3-14 Estimated Total Construction Emissions for Project Alternatives (with Required Controls) (2 Years) 3.3-32
Table 3.3-15 Estimated Operational Emissions for Project Alternatives (Required Controls) 3.3-33
Table 3.3-16 Annual Construction Emissions Compared to General Conformity Thresholds for the SCH Project Alternatives (with Required Controls) 3.3-43
Table 3.3-17 Percentage of Construction Emissions from SCH Alternatives Compared to Regional Inventory (with Required Controls) 3.3-44
Table 3.4-1 Summary of Impacts on Biological Resources 3.4-2
Table 3.4-2 Mapped Vegetation/Habitat in the SCH Project Area 3.4-8
Table 3.4-3 Fish Habitat Requirements 3.4-15
Table 3.4-4 Special-Status Species Potentially Affected by the SCH Project 3.4-20
Table 3.4-5 Estimated Sediment DDE Concentrations (ng/g) for Existing Conditions/No Action and SCH Project Alternatives 3.4-33
Table 3.5-1 Summary of Impacts on Cultural Resources 3.5-1
Table 3.5-2 Known Cultural Resources in the Study Area 3.5-9
Table 3.6-1 Summary of Impacts on Energy Consumption 3.6-1
Table 3.6-2 Power Requirements (in Kilowatt Hours) for Different Residence Times and Salinity Concentrations 3.6-5
Table 3.7-1 Summary of Impacts on Environmental Justice 3.7-1
Table 3.7-2 Distribution of Minority Populations in the Vicinity of the Project Area 3.7-3
Table 3.7-3 Poverty Thresholds by Family Size (2009) 3.7-4
Table 3.7-4 Economic Profile of the Project Area (2000) 3.7-4
Table 3.8-1 Summary of Impacts on Geology and Soils 3.8-1
Table 3.9-1 Summary of Impacts on GHG Emissions/Climate Change 3.9-2
Table 3.9-2 Summary of State Laws and Executive Orders that Address Climate Change 3.9-3
Table 3.9-3 Estimated Construction GHG Emissions for Alternatives 1 to 6 ..... 3.9-13

Table 3.9-4 Estimated Operational Direct GHG Emissions for Alternatives 1 to 6 ..... 3.9-13
Table 3.9-5 Estimated Operational Indirect GHG Emissions from Electric Power Usage for Alternatives 1 to 6 ..... 3.9-14
Table 3.9-6 Estimated Operational Combined Direct and Indirect GHG Emissions for Alternatives 1 to 6 ..... 3.9-14
Table 3.10-1 Summary of Impacts on Hazards and Hazardous Materials 3.10-1
Table 3.10-2 Online Databases Used to Search for Hazardous Materials Records 3.10-5
Table 3.10-3 Description of Sites with Hazardous Waste Identified from Database Search 3.10-6
Table 3.10-4 Comparisons of Estimated Safe Fish and Duck Consumption Rates and Advisories for the Salton Sea Based on Selenium Concentrations in Fish Tissues 3.10-8
Table 3.4-5 Sediment DDE concentrations (ng/g dry weight) for Existing Conditions/No Project and SCH Project 3.10-9
Table 3.10-6 Public Airports near the Salton Sea 3.10-11
Table 3.10-7 Predicted Selenium Concentrations in Whole Fish Tissue at New and Alamo River Sites under Varying Salinity Ranges 3.10-20
Table 3.11-1 Summary of Impacts on Hydrology and Water Quality 3.11-1
Table 3.11-2 Impaired Water Bodies within the Salton Sea Watershed 3.11-4
Table 3.11-3 Designated Beneficial Uses for Surface Waters in the SCH Project Area 3.11-5
Table 3.11-4 Statistical Representation of Mean Daily Stream Flow 3.11-13
Table 3.11-5 Comparison of Water Quality Objectives with Current Conditions (2004-2010 Mean Annual) 3.11-15
Table 3.11-6 DDE Concentrations in Sediment at SCH Project Area (ng/g) 3.11-20
Table 3.11-7 Estimated Annual Diversion Rates for SCH Under Differing Residence Times and Salinties[1] 3.11-23
Table 3.11-8 River Diversions as a Function of Average Annual New and Alamo River Flows 3.11-26
Table 3.11-9 River Diversions as a Function of Peak New and Alamo River Flows1 ..... 3.11-28
Table 3.11-10 Salton Sea Surface Elevation and Area – No Action[1] / SCH Project Alternatives 3.11-40
Table 3.11-11 Salton Sea Salinity – No Action and SCH Project 3.11-41
Table 3.13-1 Summary of Impacts on Land Use 3.13-1
Table 3.13-2 Project Consistency with Applicable County of Imperial General Plan Goals and Objectives 3.13-12
Table 3.14-1 Summary of Noise Impacts 3.14-1
Table 3.14-2 Typical Sound Levels Measured in the Environment and Industry 3.14-2
Table 3.14-3 County of Imperial Construction Noise Standards 3.14-3
Table 3.14-4 Imperial County Noise/Land Use Compatibility Guidelines 3.14-5
Table 3.14-5 County of Imperial Operation Noise Standards 3.14-5
Table 3.14-6 Alternative 1 – Estimated Equipment Use During Construction and Maintenance 3.14-8
Table 3.14-7 Attenuation of a Noise Source of 78 to 88 dBA 3.14-8
Table 3.14-8 Alternative 2 – Estimated Equipment Use During Construction and Maintenance 3.14-10
Table 3.14-9 Alternative 3 – Estimated Equipment Use During Construction and Maintenance 3.14-11
Table 3.14-10 Alternative 4 – Estimated Equipment Use During Construction and Maintenance 3.14-12
Table 3.14-11 Alternative 5 – Estimated Equipment Use During Construction and Maintenance 3.14-15
Table 3.14-12 Alternative 6 – Estimated Equipment Use During Construction and Maintenance 3.14-16

Table 3.15-1 Summary of Impacts on Paleontological Resources 3.15-1
Table 3.16-1 Summary of Impacts on Population and Housing 3.16-1
Table 3.17-1 Summary of Impacts on Public Services 3.17-1
Table 3.18-1 Summary of Impacts on Recreation 3.18-1
Table 3.19-1 Summary of Impacts on Socioeconomics 3.19-1
Table 3.19-2 Employment by Industry in Imperial County 3.19-3
Table 3.19-3 Change in Cropping Patterns, 2000-2009 ..... 3.19-5
Table 3.19-4 Top Ten Commodities in Imperial County in 2009 and Rankings over Time 3.19-5
Table 3.19-5 Percentage of Exposed Playa Covered as a Result of Alternative 1 ..... 3.19-9
Table 3.19-6 Percentage of Exposed Playa Covered as a Result of Alternative 2 ..... 3.19-12
Table 3.19-7 Percentage of Exposed Playa Covered as a Result of Alternative 3 ..... 3.19-12
Table 3.19-8 Percentage of Exposed Playa Covered as a Result of Alternative 4 ..... 3.19-13
Table 3.19-9 Percentage of Exposed Playa Covered as a Result of Alternative 5 ..... 3.19-14
Table 3.19-10 Percentage of Exposed Playa Covered as a Result of Alternative 6 ..... 3.19-15
Table 3.20-1 Summary of Impacts on Transportation and Traffic 3.20-1
Table 3.20-2 Level of Service Definitions 3.20-3
Table 3.20-3 Imperial County Standard Street Classification and Average Daily Vehicle Trips 3.20-4
Table 3.20-4 Recent Traffic Volumes and LOS on Key Roadways near the Salton Sea 3.20-7
Table 3.20-5 Traffic Volumes on County Roadways near the Salton Sea 3.20-8
Table 3.21-1 Summary of Impacts on Utilities and Service Systems 3.21-1
Table 3.21-2 Solid Waste Landfill Waste Types and Capacity 3.21-3
Table 4-1 Related Projects Impact Summary 4-15
Table 6-1 Public Involvement Meeting Dates and Primary Topics Addressed 6-11
Table 6-2 Agency Consultation / Coordination Meeting Dates and Primary Topics Addressed 6-13
Table 6-3 Elected Officials' Consultation and Coordination Meeting Dates and Primary Topics Addressed 6-13
Table 7-1 Summary of Impacts, by Resource, of Each Project Alternative 7-2

Figures

Figure 1-1 Regional Setting and Generalized Locations of SCH Alternative Sites 1-2
Figure 1-2 Portion of SCH Sites under State Lands Commission Jurisdiction 1-13
Figure 2-1 Initial Conceptual Locations for SCH Ponds 2-3
Figure 2-2 SCH Project Alternative Locations 2-8
Figure 2-3 Conceptual Plan of Cascading and Individual SCH Pond Units 2-12
Figure 2-4 Conceptual Cross-Section of Pond Berm and Outlet Structure 2-14
Figure 2-5 Location of IID's Three-Phase Power Lines and Potential Project Extensions 2-18
Figure 2-6 Conceptual Layout of Alternative 1 2-31
Figure 2-7 Conceptual Layout of Alternative 2 2-35
Figure 2-8 Conceptual Layout of Alternative 3 2-39
Figure 2-9 Conceptual Layout of Alternative 4 2-43

Figure 2-10 Conceptual Layout of Alternative 5 2-47
Figure 2-11 Conceptual Layout of Alternative 6 2-51
Figure 3.1-1 Representative Photos of the Study Area (Photos 1-5) 3.1-3
Figure 3.1-2 Representative Photos of the Study Area (Photos 6-9) 3.1-4
Figure 3.1-3 Key Observation Points 3.1-5
Figure 3.2-1 Farmland Classifications near the New River 3.2-6
Figure 3.2-2 Farmland Classifications near the Alamo River 3.2-7
Figure 3.4-1 Plant Communities in the Vicinity of the New River 3.4-6
Figure 3.4-2 Plant Communities in the Vicinity of the Alamo River 3.4-7
Figure 3.6-1 IID's Power Distribution System near the SCH Project 3.6-3
Figure 3.8-1 Location of Faults near the Salton Sea 3.8-2
Figure 3.8-2 Geologic Time Scale 3.8-5
Figure 3.10-1 Military Airspace near the New and Alamo River Sites 3.10-13
Figure 3.11-1 Salton Sea Contributing Watershed 3.11-2
Figure 3.11-2 Salton Sea Water Surface Elevation 3.11-8
Figure 3.11-3 Annual Flow for the Primary Watercourses Tributary to the Salton Sea 3.11-9
Figure 3.11-4 New River Exceedance Plot of Average Daily Flows 3.11-10
Figure 3.11-5 Alamo River Exceedance Plot of Average Daily Flows 3.11-12
Figure 3.11-6 Imperial Irrigation District Service Area and Agricultural Drain Network 3.11-14
Figure 3.11-7 New River Flow Rates with Project Diversion 3.11-32
Figure 3.11-8 Alamo River Flow Rates with Project Diversion 3.11-33
Figure 3.11-9 Simulated Salton Sea Elevation under the No Action Alternative 3.11-37
Figure 3.11-10 Simulated Salton Sea Salinity under the No Action Alternative 3.11-38
Figure 3.13-1 Zoning Designations near the New River 3.13-5
Figure 3.13-2 Zoning Designations near the Alamo River 3.13-6
Figure 3.13-3 Existing Land Uses near the New and Alamo Rivers 3.13-7
Figure 3.18-1 Recreational Resources at the Salton Sea 3.18-3
Figure 3.20-1 Regional Circulation System 3.20-2
Figure 3.20-2 Proposed Route 7 of the County of Imperial Bicycle Master Plan 3.20-6
Figure 3.20-3 Road Network around New River 3.20-9
Figure 3.20-4 Road Network around Alamo River 3.20-10
Figure 4-1 General Geographic Scope of Cumulative Impact Analysis 4-3

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Executive Summary

ES1.1 INTRODUCTION

This Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) evaluates the impacts of alternative methods of implementing the Salton Sea Species Conservation Habitat Project (SCH Project or Project). The SCH Project is intended to serve as a proof of concept for the restoration of shallow water habitat that currently supports fish and wildlife dependent upon the Salton Sea (the Sea); this habitat is being lost due to salinity increases and the declining Sea elevation. This section of the EIS/EIR presents background and introductory information, and describes the authorities of the lead agencies (United States [U.S.] Army Corps of Engineers [Corps] and the California Natural Resources Agency) in preparing this EIS/EIR, the public outreach program, and the scope and contents of the EIS/EIR. This EIS/EIR has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code section 4341 et seq.), and in conformance with the Council on Environmental Quality NEPA guidelines and the Corps' NEPA Implementing Regulations. The document also fulfills the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) and the State CEQA Guidelines (Title 14, California Code of Regulations section 15000 et seq.). The Corps is the NEPA lead agency, and the California Natural Resources Agency is the CEQA lead agency. The EIS/EIR was prepared under the direction of the California Department of Fish and Game (DFG) and California Department of Water Resources on behalf of the Natural Resources Agency and the Secretary for Natural Resources.

ES1.2 PROJECT LOCATION

The Project would be located at the southern end of the Salton Sea in Imperial County, California. Alternative sites for implementing the SCH Project are located near the mouths of the New and Alamo rivers.

ES1.3 CEQA PROJECT GOALS AND OBJECTIVES / NEPA PURPOSE AND NEED

The Salton Sea currently supports a wide variety of bird species and a limited aquatic community. Over many decades, the components of the aquatic-dependent community have shifted in response to receding water levels and increasing salinity. The Salton Sea is currently a hypersaline ecosystem (about 51 ppt) (C. Holdren, Reclamation, unpublished data). Without restoration, declining inflows in future years will result in the Sea's ecosystem collapse due to increasing salinity (expected to exceed 60 ppt by 2018, which is too saline to support fish) and other water quality stresses, such as temperature extremes, eutrophication, and related anoxia due to algal productivity.

The most serious and immediate threat to the Salton Sea ecosystem is the loss of fishery resources that support piscivorous birds. The birds that feed on invertebrates have more options and resources, because the invertebrate fauna has a wider range of salinity tolerances. Piscivorous birds, on the other hand, are at risk of decline. To address this immediate need, the California Legislature appropriated funds for the purpose of implementing "conservation measures necessary to protect the fish and wildlife species dependent on the Salton Sea, including adaptive management measurements" (California Fish and Game Code section 2932(b)). Therefore, under CEQA the SCH Project's goals are two-fold: (1) develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea; and (2) develop

and refine information needed to successfully manage the SCH Project habitat through an adaptive management process. Specific objectives under each goal are described in detail in Section 1 of this EIS/EIR.

Goal 1: Develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea.

The SCH Project's purpose is to provide in-kind replacement for near-term habitat losses. The Project's target species are those piscivorous bird species that use the Salton Sea and are dependent on shallow saline habitat for essential habitat requirements within their western geographic range. The Salton Sea plays an important role in supporting significant portions of the populations of some of these birds.

OBJECTIVES FOR GOAL 1:

1) Provide appropriate foraging habitat for piscivorous bird species.
2) Develop physical structure and microhabitat elements required to support piscivorous bird species.
3) Support a sustainable, productive aquatic community.
4) Provide suitable water quality for fish.
5) Minimize adverse effects on desert pupfish.
6) Minimize risk of selenium.
7) Minimize risk of disease/toxicity impacts.

Goal 2: Develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process.

The SCH Project's second goal would be to serve as a proof of concept for the restoration of shallow-water habitat that supports fish and wildlife currently dependent upon the Salton Sea. The Project would incorporate an adaptive management framework to guide evaluation and improved management of the newly created habitat as well as to inform future restoration. An adaptive management framework provides a flexible decision-making process for ongoing knowledge acquisition, monitoring, and evaluation, leading to continuous improvement in management planning and Project implementation to achieve specified objectives. The information obtained would be used to measure Project effectiveness, to refine operations and management of the ponds, to reduce uncertainties about key issues, and to inform subsequent stages of habitat restoration at the Salton Sea.

OBJECTIVES FOR GOAL 2:

1) Identify uncertainties in achieving the objectives of providing habitat and prey for piscivorous birds (e.g., maintaining suitable water temperature and dissolved oxygen) and minimizing impacts on species (e.g., selenium ecorisk).
2) Develop and implement a monitoring plan.
3) Develop a decision-making framework.
4) Provide proof of concept for future restoration.

The purpose of the Project under NEPA is to develop a range of aquatic habitats that will support wildlife species dependent on the Salton Sea in Imperial County, California.

ES1.4 DRAFT SECTION 404(B)(1) ALTERNATIVES ANALYSIS BASIS AND OVERALL PROJECT PURPOSE

The Clean Water Act (CWA) section 404(b)(1) Guidelines (Guidelines) promulgated by the U.S. Environmental Protection Agency explain that, when an action is subject to NEPA and the Corps is the permitting agency, the analysis of alternatives prepared for NEPA will, in most cases, provide the information needed for analysis under the Guidelines. The Guidelines also state that, in some cases, the NEPA document may have addressed "a broader range of alternatives than required to be considered under [the Guidelines] or may not have considered alternatives in sufficient detail to respond to the details of these Guidelines. In the latter case, it may be necessary to supplement these NEPA documents with this additional information" (40 Code of Federal Regulations [CFR] section 230.10(a)(4)). In light of this statement in the Guidelines, and because the Project purpose statement under NEPA and the Guidelines are not necessarily identical, the Corps has reviewed and refined the Project purpose to ensure it meets the standards of the Guidelines.

For CWA section 404 purposes, the Draft Section 404(b)(1) Alternatives Analysis, to be included as an appendix in the Final EIS/EIR, provides the following statement of basis and overall project purpose:

> The basic project purpose comprises the fundamental, essential, or irreducible purpose of the proposed action, and is used by the Corps to determine whether an applicant's project is water dependent (i.e., whether it requires access or proximity to or siting within a special aquatic site). The basic project purpose for the SCH Project is aquatic habitat restoration. The SCH Project is water dependent. Therefore, the rebuttable presumptions that there is a less damaging practicable alternative for the proposed activity that would not affect jurisdictional waters do not apply (40 CFR section 230.10(a)(3)).

The overall Project purpose is to develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea in Imperial County, California.

ES1.5 SPECIES SUPPORTED BY THE SPECIES CONSERVATION HABITAT PROJECT

ES1.5.1 Aquatic Species

Aquatic organisms that currently or in the recent past comprise the food web supporting fish in the Salton Sea include phytoplankton, zooplankton, and benthic and water column macroinvertebrates. Macroinvertebrate species include diptera (flies), corixids (water boatmen), benthic polychaetes such as pileworms (*Neanthes succinea*) and a spionid worm (*Streblospio benedicti*), amphipods (*Gammarus mucronatus* and *Corophium louisianum*), ostracods (seed shrimp), and a barnacle (*Balanus amphitrite*) (Detwiler et al. 2002; Miles et al. 2009), while zooplankton is dominated by copepods (Miles et al. 2009). These or other species with similar habitat functions and food-web functions would become established or would be introduced into the SCH ponds.

Although a number of fish species were present in the Salton Sea while salinity was in the range of marine waters, those fish were introduced for recreational fishing and not as forage for birds. Tilapia that inhabit the Sea are hybrids between the Mozambique tilapia (*Oreochromis mossambicus*) and Wami River tilapia (*O. urolepis hornorum*) (Costa-Pierce 2001). These fish, called California Mozambique hybrids ("Mozambique hybrid tilapia"), are currently the most abundant fish in the Sea and have been extensively used as forage by birds because their size range and location within the water column makes them easily accessible.

To support piscivorous birds, the SCH Project would need to provide fish of a size and quantity that the birds can use. Many of the plankton and macroinvertebrate components of the aquatic food web that support the fish will be present in the water used to fill the SCH ponds and would multiply there. For species of macroinvertebrates that are no longer present or present in very low numbers (e.g., pileworms and barnacles), inoculation with those species (or species with similar ecological functions) would be considered. Fish species that are currently present, or have been present in the past, and that would be suitable for the SCH ponds include several species and hybrids of tilapia, sailfin molly (*Poecilia latipinnna*), and threadfin shad (*Dorosoma petenense*). These species have been selected as the most likely to survive and have the least potential for adverse effects on the desert pupfish (*Cyprinodon macularius*), which is a protected species. Other species could also be used, particularly if some of these do not become abundant enough to support bird foraging.

ES1.5.2 Piscivorous Birds

The SCH ponds are designed to accommodate those piscivorous bird species that will experience significant declines when the quality of Salton Sea habitat deteriorates substantially in the near future (i.e., American white pelican (*Pelecanus erythrorhynchos*), Black skimmer (*Rynchops niger*), Caspian tern (*Hydroprogne caspia*), Double-crested cormorant(*Phalacrocorax auritus*), and Gull-billed tern (*Gelochelidon nilotica*). For many of these species, a significant proportion of their population uses the Sea. If the amount of habitat used by these species at the Sea were substantially reduced, some individuals could use other habitats in the region up to their capacity, but it is unlikely that all of the piscivorous birds using the Sea could find suitable habitat elsewhere because it is sparsely available in this geographic region.

The SCH ponds would also benefit other bird species, such as the eared grebe, western snowy plover (*Charadrius alexandrinus nivosus)*, ruddy duck (*Oxyura jamaicensis*), black tern *(Chlidonias niger)*, and California brown pelican (*Pelecanus occidentalis*). These species are either not piscivorous (invertebrate prey is easier to support than fish) and/or only a small proportion of their population depends on the Salton Sea. Also, some subspecies or population segments would likely use the restored habitats as well, such as the least tern (interior subspecies of the California least tern or Mexican least tern, whichever is present at the Salton Sea) and the Baja population of the California brown pelican, which uses the Sea as a post-breeding site. While the SCH ponds would provide ancillary benefits for these species, they are not the principal species served by the SCH Project and, therefore, their habitat needs would not be considered criteria for design.

ES1.6 ENVIRONMENTAL REVIEW PROCESS

Public scoping was conducted to help identify areas of concern and specific issues that should be addressed in the EIS/EIR. In compliance with NEPA, the Corps issued a Notice of Intent for the preparation of the EIS/EIR on June 23, 2010. In compliance with CEQA, the Natural Resources Agency issued a Notice of Preparation for the EIS/EIR on June 21, 2010. These notices are included in Appendix A, Scoping Process. The notices were sent to over 1,300 responsible and involved agencies and interested organizations and individuals. To solicit additional comments on the scope and content of the EIS/EIR, the lead agencies held four public scoping meetings at Palm Desert, Thermal, Calipatria, and Brawley on July 7 and 8, 2010. The four scoping meetings attracted over 50 people, some of whom provided oral comments on the scope and content of the EIS/EIR, including project design and impacts. Twelve written responses to the notices were received during the comment period which ended on July 24, 2010. The most common topics mentioned included the project description, water supplies, adaptive management, siting criteria, baseline conditions, resource-specific impacts and mitigation measures, as well as impacts of expanding the range of species that would be benefited by the SCH Project, addressing issues associated with selenium exposure, and the need to address the potential creation of breeding habitat for

mosquitoes, which are disease vectors. Additionally, a number of commenters, including the U.S. Environmental Protection Agency, Reclamation, San Diego County Water Authority, and a group of non-governmental organizations, expressed overall support for the SCH Project. The information from scoping was used to shape the scope, content, and level of detail in the EIS/EIR and in all phases of document preparation. A complete description of the scoping process and comments received is included in the scoping report provided in Appendix A.

ES1.7 PURPOSE OF THE EIS/EIR

This joint EIS/EIR is intended to identify to agency decision makers and the public the potential range of impacts associated with the implementation of the Project alternatives, including significant and beneficial environmental impacts. As described below, each of the lead agencies has independent regulatory compliance needs that are served by this EIS/EIR.

ES1.7.1 NEPA and the Purpose of an EIS

NEPA requires decision makers from Federal agencies to document and consider the impacts on the environment from their actions before making decisions and take actions that protect, restore, and enhance the environment. An EIS is prepared when an agency determines that an action could result in one or more significant impacts on the environment in order to provide a full disclosure of anticipated impacts. The EIS informs decision-makers and the public of reasonable alternatives that would avoid or minimize significant impacts or enhance the quality of the human environment.

ES1.7.2 CEQA and the Purpose of an EIR

CEQA requires state and local agency decision makers to consider the environmental consequences of their actions. An EIR is prepared when such agencies determine that a project has the potential to result in one or more significant environmental impacts. The purpose of an EIR is to identify the environmental impacts resulting from a project, identify alternative ways of implementing a project that could reduce or avoid significant impacts, and identify ways in which significant impacts can be reduced or avoided. When feasible mitigation measures do not exist, a project may still be carried out if the approving agency finds that economic, legal, social, technological, or other benefits outweigh the unavoidable significant impacts.

ES1.8 INTENDED USES OF THE DRAFT EIS/EIR

The Draft EIS/EIR has been prepared in accordance with applicable Federal and state environmental statutes, regulations, and policies and is intended to inform Federal and state decision makers regarding the potential impacts of the Project alternatives and help them identify the preferred alternative. The Draft EIS/EIR is an informational document and does not recommend approval or denial of the Project. The Draft EIS/EIR is being provided to the public in order to obtain comments on the scope and impacts of the Project alternatives. A Final EIS/EIR will be prepared that takes into consideration comments received from agencies, organizations, and individuals; and responses to each comment will be provided. The Final EIS/EIR will be the basis for decision making by the Corps, the Natural Resources Agency, and other concerned agencies.

ES1.8.1 Corps' Use of the EIS/EIR

The Corps will use this EIS/EIR in determining whether to issue a Department of the Army permit for the SCH Project under section 404 of the CWA. The EIS/EIR will also support the Corps' consultations with the California State Historic Preservation Office regarding potential impacts on cultural resources and with the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts on endangered species. The

Corps will issue a Record of Decision that documents its decision on the preferred alternative pursuant to its regulatory authority under section 404 of the CWA.

ES1.8.2 Natural Resources Agency's Use of the EIS/EIR

The Natural Resources Agency will use the EIS/EIR in deciding whether to approve and implement the preferred alternative and also will use the EIS/EIR as the basis for its applications for approval under section 401 and 404 of the Clean Water Act and other required permits. The Natural Resources Agency will certify the EIR, as appropriate, and issue a Notice of Completion, Findings of Fact, and Statement of Overriding Considerations (if necessary) that will document its decision regarding the adequacy of the EIR.

ES1.8.3 Cooperating, Responsible, and Trustee Agency Actions

Under NEPA, cooperating agencies are agencies other than the lead agency that have discretionary authority over a proposed action, jurisdiction by law, or special expertise with respect to the environmental impacts expected to result from an action. The U.S. Bureau of Reclamation is a cooperating agency for the preparation of this EIS/EIR and has special expertise related to restoration planning, as well as jurisdiction by law over lands located near the Project area. The USFWS also is a cooperating agency because portions of the ponds at the New River sites would be located on land that is part of Sonny Bono Salton Sea National Wildlife Refuge and managed by the USFWS.

Under CEQA, responsible agencies are all agencies other than the lead agency that have discretionary approval power over a project. DFG will use the EIS/EIR in deciding whether to issue a Streambed Alteration Agreement under section 1602 or 1605 of the California Fish and Game Code and Incidental Take Permit under section 2081 of the California Endangered Species Act. Imperial Irrigation District (IID) also is a responsible agency because the SCH Project primarily would be located on land that is owned by IID. The Colorado River Basin Regional Water Quality Control Board is a responsible agency because it would be required to issue a Clean Water Act section 401 water quality certification.

The California State Lands Commission (SLC) is a trustee agency, defined in section 15386 of the CEQA Guidelines as "...a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California." The SLC will use the EIS/EIR in determining whether to issue a lease agreement for impacts on the Salton Sea, for any portion of the SCH Project within its jurisdiction. The SLC has determined that one parcel included in the potential SCH Project sites is within its jurisdiction. Parcel 020-010-030 is located within the Alternatives 4 and 6 sites, and its use would require a lease agreement with the SLC.

ES1.9 REQUIRED PERMITS AND CONSULTATIONS

The following permits and consultations are expected to be required:

- Federal Clean Water Act section 404 Standard Individual Permit from the Corps;
- Federal Clean Water Act section 401 water quality certification from the Colorado River Basin Regional Water Quality Control Board;
- National Historic Preservation Act section 106 consultation with State Historic Preservation Office;
- Federal Endangered Species Act section 7 consultation with the USFWS;
- California Fish and Game Code section 1602 or 1605 Streambed Alteration Agreement from DFG;
- California Endangered Species Act section 2081 Incidental Take Permit from DFG;

- California SLC lease agreement for impacts on the Salton Sea for the use of parcel 020-010-030; and
- IID Board approval of the SCH Project lease agreement.

Additionally, the Imperial County Air Pollution Control District would require preparation of a Fugitive Dust Control Plan under Regulation VIII, Fugitive Dust Rules (800–806). Easements would be required from landowners for Project facilities during construction and operations. Haul permits and encroachment permits may be required for the use of area roadways during construction.

ES1.10 SCOPE AND CONTENTS OF THE DRAFT EIS/EIR

This Draft EIS/EIR includes all of the sections required by NEPA and CEQA. The scope of the Federal review is normally defined by 33 CFR part 325, Appendix B, which states: "…the district engineer should establish the scope of the NEPA document to address the impacts of the specific activity regarding the Department of the Army permit and those portions of the entire project over which the district engineer has sufficient control and responsibility to warrant Federal review."

Corps regulations require the Corps to determine if their "scope of review" or "scope of analysis" should be expanded to account for indirect and/or cumulative effects of the issuance of a permit (33 CFR part 325, Appendix B). Typical factors considered in determining "sufficient control and responsibility" include:

- Whether or not the activity constitutes merely a link in a corridor-type project;
- Whether aspects of the upland facility in the immediate vicinity of the regulated activity affect the location and configuration of the regulated activity;
- Extent to which the entire project will fall within Corps jurisdiction; and
- Extent of Federal cumulative control and responsibility.

Based on 33 CFR part 325, Appendix B, the appropriate scope of analysis for the Federal review of the selected action consists of the entire Project footprint.

Additionally, U.S. Environmental Protection Agency section 404(b)(1) Guidelines require the Corps to issue a permit only for the "least environmentally damaging practicable alternative," which is the most practicable alternative that would result in the least damage to aquatic resources and is not contrary to public interest. The factors that influence whether an alternative is practicable include cost, logistics, technology, and the ability of the alternative to achieve the overall project purpose. The section 404(b)(1) Guidelines focus on the impacts on the aquatic environment of discharges of dredged or fill material in waters of the U.S. As such, the scope of the section 404(b)(1) analysis is typically narrower than that of the NEPA analysis and could reach different conclusions regarding the practicability of an alternative.

The section 404(b)(1) Guidelines (40 CFR section 230) state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge that would have a less significant impact on the aquatic ecosystem, so long as the alternative does not have other significant environmental consequences (40 CFR section 230.10[a]). A section 404(b)(1) evaluation typically includes the following type of analysis:

- Factual determinations (e.g., on the physical substrate, water circulation, fluctuation, and salinity, suspended particulates/turbidity, contaminants, aquatic ecosystem and organisms, proposed disposal sites, and cumulative effects on the aquatic ecosystem);

- Findings of compliance or noncompliance with restrictions on discharge, including evaluation of the availability of practicable alternatives that would have a less significant impact on the aquatic ecosystem, and compliance with a variety of regulations (e.g., applicable state water quality standards, toxic effluent standards or prohibitions under section 307 of the CWA, the Federal Endangered Species Act, and the Marine Protection, Research and Sanctuaries Act);
- Identification of practical steps taken to minimize potential significant impacts of the discharge on the aquatic ecosystem; and
- Conclusion about the compliance of the proposed Project with the section 404(b)(1) Guidelines.

The information presented in this Draft EIS/EIR specific to impacts on the aquatic environment would be used by the Corps as part of any proposed permit action subject to section 404 of the CWA.

ES1.11 ALTERNATIVES CONSIDERED IN THE DRAFT EIS/EIR

The alternatives being considered in the EIS/EIR are as follows; the ponds would be supplied with a combination of river water and seawater in order to achieve the desired salinity range:

- **Alternative 1 – New River, Gravity Diversion + Cascading Ponds[1]:** 3,130 acres of ponds constructed on either side of the New River (East New and West New), upstream gravity diversion of river water, and independent and cascading pond units.
- **Alternative 2 – New River, Pumped Diversion:** 2,670 acres of ponds constructed on either side of the New River (East New, West New, and Far West New), pumped river diversion at the SCH ponds, and independent ponds.
- **Alternative 3 – New River, Pumped Diversion + Cascading Ponds:** 3,770 acres of ponds constructed on either side of the New River (East New, West New, and Far West New), pumped diversion of river water, and independent ponds extended to include Far West New and cascading pond units. Alternative 3 is the Natural Resources Agency's preferred alternative. The Corps has not yet identified a preferred alternative among the alternatives evaluated by the Draft EIS/EIR.
- **Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond:** 2,290 acres of ponds constructed on the north side of the Alamo River (Morton Bay), gravity river diversion upstream of the SCH ponds, with independent ponds and a cascading pond unit.
- **Alternative 5 – Alamo River, Pumped Diversion:** 2,080 acres of ponds constructed on the north side of the Alamo River (Morton Bay and Wister Beach), pumped river diversion at the SCH ponds, and independent pond units.
- **Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds:** 2,940 acres of ponds constructed on the north side of the Alamo River (Morton Bay, Wister Beach), pumped river diversion at the SCH ponds with independent and cascading pond units.

The No Action Alternative also is considered in this analysis, as required by NEPA and CEQA. Under the No Action Alternative, the Corps would not issue a section 404 permit for the SCH Project, and no components of the SCH Project would be constructed. The No Action Alternative is intended to reflect existing conditions (those present at the time the Notice of Preparation was issued) plus changes that are reasonably expected to occur in the foreseeable future if none of the SCH Project alternatives is implemented.

[1] All of the alternatives include independent ponds; thus, the name of the alternative reflects those ponds that also include cascading ponds.

ES1.12 SUMMARY OF IMPACTS

The impacts of the SCH Project alternatives on each resource evaluated in this Draft EIS/EIR were compared to both the existing environmental conditions, as well as those that would occur under the No Action Alternative (Table ES-1). For many resources no substantive differences existed between those two scenarios, either because impacts would cease upon the completion of construction, in which case the future conditions would not be relevant, or because future changes at the Salton Sea would not be relevant to the impact analysis (e.g., the amount of noise generated by pumps used to divert river water to the SCH ponds would not be affected by changes in the salinity or surface water elevation of the Salton Sea). For resources such as biological resources and recreation, the benefits of the Project alternatives would be greater when compared to the No Action Alternative because the increasing salinity and decreasing water surface elevation of the Salton Sea will result in the collapse of the Sea's ecosystem, and the SCH Project would help offset some of the impacts from this occurrence. The beneficial impacts of the Project on aesthetic resources also would be greater in comparison to the No Action Alternative. In no case, however, did the comparison of impacts between the existing conditions and the No Action Alternative result in a change in the significance of the impact.

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Aesthetics								
Impact AES-1: Project construction could temporarily degrade the scenic quality, character, or scenic vistas of the site and surrounding areas.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AES-2: The SCH ponds would enhance the scenic quality and character of the site and surrounding areas.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AES-4: Some construction activities may occur at night, requiring lighting.	Existing Condition	L	L	L	S	S	S	MM AES-1: Shield and direct construction lights away from Red Hill Park.
	No Action	L	L	S	S	S	S	Same as Existing Condition
Agricultural Resources								
Impact AG-1: Construction of the diversion and conveyance facilities and brackish water pipeline maintenance would temporarily disrupt agricultural production but would not permanently convert Farmland to nonagricultural use.	Existing Condition	L	O	O	L	O	O	None required
	No Action	L	O	O	L	O	O	None required

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact AG-2: Construction of the sedimentation basin would result in the permanent conversion of a small amount of Farmland to nonagricultural use.	Existing Condition	L	O	O	L	O	O	None required
	No Action	L	O	O	L	O	O	None required
Impact AG-3: Construction of the sedimentation basin potentially would result in the permanent conversion of Williamson Act contract land to nonagricultural use.	Existing Condition	S	O	O	S	O	O	MM AG-1: Avoidance of Williamson Act land or payment of Williamson Act cancellation fees.
	No Action	S	O	O	S	O	O	Same as Existing Condition
Air Quality								
Impact AQ-1: Emissions from Project construction and maintenance are accounted for in applicable air quality plans and would not conflict with or obstruct their implementation.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AQ-2: The SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact AQ-3a: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X and PM_{10} thresholds during construction (applies to Alternatives 1, 2, and 3).	Existing Condition	U	U	U	—	—	—	MM AQ-1: Implement fugitive PM_{10} control measures. MM AQ-2: Implement diesel control measures.
	No Action	U	U	U	—	—	—	Same as Existing Condition
Impact AQ-3b: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X thresholds during construction (applies to Alternatives 4, 5, and 6).	Existing Condition	—	—	—	U	U	U	MM AQ-1: Implement fugitive PM_{10} control measures. MM AQ-2: Implement diesel control measures.
	No Action	—	—	—	U	U	U	Same as Existing Condition
Impact AQ-4: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards during operations but would not exceed any regulatory thresholds.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AQ-5: Project construction would result in a cumulatively considerable/significant net increase in	Existing Condition	U	U	U	U	U	U	MM AQ-1: Implement fugitive PM_{10} control measures. MM AQ-2: Implement diesel

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
emissions.								control measures.
	No Action	U	U	U	U	U	U	Same as Existing Condition
Impact AQ-6: Project emissions from construction and maintenance would not expose sensitive receptors to substantial pollutant concentrations.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AQ-7: The Project could result in localized odors during construction, operations, and maintenance.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AQ-8: The Project would have a minor effect on the microclimate near the Salton Sea.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Biological Resources								
Impact BIO-1a: Project construction and operation would affect habitat and individuals of desert pupfish and several special-status bird species.	Existing Condition	S	S	S	S	S	S	MM BIO-1: Prepare and implement a desert pupfish protection and relocation plan. MM BIO-2: Prepare and implement a preconstruction/ maintenance survey plan for bird species. MM BIO-3: Conduct noise measurements and implement noise attenuation measures, if needed. MM BIO-4: Design interception ditches to avoid alteration of water levels in adjacent marshes.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact BIO-1b: Project construction and operation would have minor effects on habitat and individuals of several special-status bird and mammal species.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact BIO-1c: Project operation would provide habitat for desert pupfish and several special-status bird species.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact BIO-2: Project construction and operation would cause a temporary disturbance or loss of riparian habitat and/or sensitive habitat.	Existing Condition	S	S	S	S	S	S	MM BIO-5: Prepare and implement a Habitat Protection, Mitigation, and Restoration Program.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact BIO-3a: Project construction would result in temporary disturbance of Federal Waters of the U.S. and minimal effects on wetlands.	Existing Condition	L	L	L	L	L	L	MM BIO-4 MM BIO-5
	No Action	L	L	L	L	L	L	Same as Existing Condition
Impact BIO-3b: Project operation would increase the amount of Federal Waters of the U.S.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact BIO-4: Project construction and operation would not interfere with movement of fish and wildlife species, but construction could remove snags for colonial nesting birds.	Existing Condition	L	L	L	L	L	L	MM BIO-5
	No Action	L	L	L	L	L	L	Same as Existing Condition
Impact BIO-5a: Project construction and operation could affect nesting by some common bird species and introduction of invasive species.	Existing Condition	S	S	S	S	S	S	MM BIO-2 MM BIO-3 MM BIO-6: Clean equipment prior to site delivery.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact BIO-5b: Project construction and operation would have minor effects on common fish (native and nonnative), wildlife species, and native plant communities.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact BIO-5c: Project construction and operation would benefit common fish (native and nonnative) and wildlife species.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Cultural Resources								
Impact CR-1: Ground-disturbing activities could change the significance of historical resources, damage unique archaeological resources, disturb human remains, eliminate important examples of the major periods of California history or prehistory, and adversely affect historic properties.	Existing Condition	S	S	S	S	S	S	MM CR-1: Prepare and implement a survey plan and an inadvertent discovery plan
	No Action	S	S	S	S	S	S	Same as Existing Condition
Energy Consumption								
Impact EN-1: Pumping would require power for the duration of the Project.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Environmental Justice								
Impact EJ-1: Construction air emissions would have a disproportionate impact on minority and low-income populations.	Existing Condition	U	U	U	U	U	U	MM AQ-1: Implement fugitive PM_{10} control measures. MM AQ-2: Implement diesel control measures.
	No Action	U	U	U	U	U	U	Same as Existing Condition
Impact EJ-2: Ground-disturbing activities could expose and damage undiscovered prehistoric and historic resources and result in the inadvertent discovery of human remains.	Existing Condition	S	S	S	S	S	S	MM CR-1: Prepare and implement a survey plan and an inadvertent discovery plan.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Geology, Soils, and Minerals								
Impact GEO-1: A seismic event could cause the berms to fail and damage the water diversion/conveyance structures.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact GEO-2: Best management practices would be used to prevent soil erosion and the loss of topsoil during construction.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact GEO-3: The Project would be located on unstable soils, potentially affecting the stability of the berms.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact GEO-4: Construction would require the use of rock as riprap or pond substrate.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Greenhouse Gas Emissions/Climate Change								
Impact GHG-1: The Project would generate minor amounts of GHG emissions during construction and operations, both directly and indirectly, that would not have a significant impact on the environment.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact GHG 2: The Project would generate GHG emissions during construction and operations, but would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Hazards and Hazardous Materials								
Impact HAZ-1: Hazardous materials used during construction could be released into the environment.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-5: Project construction could increase the risk of wildland fire.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses.	Existing Condition	S	S	S	S	S	S	MM HAZ-1: Worker training will be provided to workers who may be exposed to air-borne diseases during excavation activities. Training will include recognizing symptoms and use of personal protective equipment.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-8: Selenium and dichlorodiphenyldichloroethylene (DDE) levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Hydrology and Water Quality								
Impact HYD-1: Project implementation would cause a reduction in the Salton Sea's water surface elevation.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HYD-2: Project implementation would increase the Salton Sea's salinity.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HYD-3: Project operations would cause changes in Salton Sea water quality but would not violate established standards.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HYD-4: Construction of the SCH ponds would temporarily degrade water quality at the Salton Sea.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HYD-5: Berm failure could increase erosion and sedimentation of	Existing Condition	L	L	L	L	L	L	None required

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
the adjacent river and the Salton Sea.	No Action	L	L	L	L	L	L	None required
Land Use								
Impact LU-1: Given the implementation of mitigation measures identified in other sections of this Environmental Impact Statement/Environmental Impact Report, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans or policies.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact LU-2: Restoration of habitat for birds that are dependent on the Salton Sea would not result in substantive conflicts with existing adjacent land uses.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Noise								
Impact NOI-1: Daytime construction and maintenance activities would cause a temporary increase in noise levels near the Project sites.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact NOI-2: Dredging could extend beyond the hours typically allowed by Imperial County.	Existing Condition	L	L	L	S	S	S	MM NOI-1: Avoid nighttime construction near Red Hill Park.
	No Action	L	L	L	S	S	S	Same as Existing Condition
Impact NOI-3: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact NOI-4: Noise from installation of the seawater pipeline and associated pump could exceed Imperial County's construction thresholds.	Existing Condition	O	O	O	S	S	O	MM NOI-2. Control noise from installation of the seawater pump and pipeline.
	No Action	O	O	O	S	S	O	Same as Existing Condition
Impact NOI-5: Noise from operation of the seawater pump could exceed	Existing Condition	O	O	O	S	O	O	MM NOI-3: Control operational noise from the

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Imperial County's thresholds at Red Hill Park.								seawater pump.
	No Action	O	O	O	S	O	O	Same as Existing Condition
Paleontological Resources								
Impact PALEO-1: Ground-disturbing activities could expose and damage undiscovered paleontological resources.	Existing Condition	S	S	S	S	S	S	MM PALEO-1: Prepare and implement a survey plan and a paleontological monitoring plan. MM PALEO-2: Conduct worker training. MM PALEO-3: Prepare and implement a paleontological resource data recovery plan.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Population and Housing								
Impact POP-1: Out-of-town construction workers would cause a temporary, slight increase in Imperial County population.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact POP-2: Project operation would increase opportunities for passive recreational activity and research due at the SCH ponds, which could result in increased visitor days.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Public Services								
Impact PS-1: Construction and maintenance activities could result in increased demand for emergency services (police, fire, and trauma centers), as could increased use of the Project site by recreational visitors.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Recreation								
Impact REC-1: The SCH Project would create recreational opportunities at the pond sites.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Socioeconomics								
Impact SOC-1: Project construction and operations would cause an increase in local employment.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact SOC-2: Project construction and operations would result in an increase in tax revenue and local business revenue due to worker income and spending and materials purchases.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact SOC-3: Project operation would increase opportunities for passive recreational activity and research at the SCH ponds.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use.	Existing Condition	L	O	L	O	L	L	None required
	No Action	L	O	L	O	L	L	None required
Impact SOC-5: The SCH Project would result in the temporary loss of agricultural revenue due to construction and maintenance activities in the water pipeline right-of-way.	Existing Condition	L	O	O	L	O	O	None required
	No Action	L	O	O	L	O	O	None required
Impact SOC-6: Pipeline construction would require the temporary disruption of agricultural drains and canals.	Existing Condition	L	O	O	L	O	O	None required
	No Action	L	O	O	L	O	O	None required
Impact SOC-7: The SCH Project would restore a portion of lost habitat for some birds that are attracted to agricultural fields.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Transportation and Traffic								
Impact TRAN-1: The SCH Project would increase traffic during construction and operations, but would not reduce the level of service of any roadways below the County of Imperial's standard (LOS C).	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact TRAN-2: Construction/maintenance equipment and tractor trailers could be present in areas used by farm equipment, but would not pose a substantial safety hazard.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact TRAN-3: Emergency vehicles would retain their ability to access the Project area during construction and operations despite increased traffic and construction near roadways.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Table ES-1 Summary of Impacts of the Salton Sea SCH Project Alternatives

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Utilities and Service Systems								
UT-1: Dust suppression water would be required, but would not exceed supplies.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
UT-2: Construction and operations would generate solid waste requiring disposal in landfills.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

ES1.13 COMPARATIVE IMPACTS OF THE PROJECT ALTERNATIVES

Table ES-2 compares impacts, by resource, for each of the six Project alternatives. In a number of cases, multiple categories of impacts would occur; that is, one resource could experience significant, less-than-significant, and beneficial impacts. Table ES-2 only shows the most adverse impact for purposes of comparison. As shown, impacts are generally comparable between alternatives. The primary differences are that those alternatives requiring a brackish water pipeline leading from the rivers (Alternatives 1 and 4) would result in the permanent conversion of Important Farmland and significant impacts from the potential conversion of land under Williamson Act contracts for use as a sedimentation basin. More subtle differences result from the acreage that would be restored under each alternative. In general, those alternatives with greater acreage would have greater benefits to resources such as biological resources, aesthetics, recreation, and socioeconomics, but also would result in greater impacts on air emissions, energy demand, transportation impacts, and demand for public services.

Table ES-2 Summary of Impacts, by Resource, of Each Project Alternative

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Aesthetics	L	L	L	L	L	L
Agricultural Resources	S	O	O	S	O	O
Air Quality	U	U	U	U[a]	U[a]	U[a]
Biological Resources	S	S	S	S	S	S
Cultural Resources	S	S	S	S	S	S
Energy Consumption	L	L	L	L	L	L
Environmental Justice	U	U	U	U	U	U

Table ES-2 Summary of Impacts, by Resource, of Each Project Alternative

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Geology and Soils	L	L	L	L	L	L
Greenhouse Gas Emissions	L	L	L	L	L	L
Hazards and Hazardous Materials	L	L	L	L	L	L
Hydrology and Water Quality	L	L	L	L	L	L
Indian Trust Assets	O	O	O	O	O	O
Land Use	L	L	L	L	L	L
Noise	L	L	L	S	S	S
Paleontological Resources	S	S	S	S	S	S
Population and Housing	L	L	L	L	L	L
Public Services	L	L	L	L	L	L
Recreation	B	B	B	B	B	B
Socioeconomics	L	L	L	L	L	L
Transportation	L	L	L	L	L	L
Utilities and Service Systems	L	L	L	L	L	L

Notes:

a.* Alternatives 4, 5, 6 would result in a significant unavoidable impact from nitrogen oxides emissions during construction, as would Alternatives 1, 2, and 3; but unlike the latter alternatives, they would not result in a significant impact from fugitive dust emissions.

O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

ES1.14 ENVIRONMENTALLY PREFERABLE / ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The Council on Environmental Quality's NEPA Guidelines, section 1505.2(b) requires that, in cases where an EIS has been prepared, the Record of Decision must identify all alternatives that were considered, ". . . specifying the alternative or alternatives which were considered to be environmentally preferable." The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA section 101. Ordinarily, this designation means the alternative that causes the least damage to the biological and physical environment; the designation also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources. In addition, U.S. Environmental Protection Agency section 404(b)(1) Guidelines require the Corps to

issue a permit only for the least environmentally damaging practicable alternative, which is the most practicable alternative that would result in the least damage to aquatic resources.

CEQA Guidelines section 15126.6 also requires the identification of the environmentally superior alternative; if the No Action Alternative is considered environmentally superior, then an environmentally superior alternative must be chosen from one of the Project alternatives. Significant, less than significant impacts, and beneficial impacts all are considered when determining which alternative is environmentally preferable/environmentally superior.

The No Action Alternative for the SCH Project is not considered environmentally superior. As discussed in Section 1, Introduction, declining inflows in future years from various factors will result in collapse of the Salton Sea ecosystem due to increasing salinity and other water quality issues, such as temperature, eutrophication, and related anoxia and algal productivity. The SCH Project alternatives would restore a portion of the habitat that will be lost under the No Action Alternative and are considered preferable.

Of the Project alternatives, those that would require gravity diversion of water from the New or Alamo rivers (Alternatives 1 and 4, respectively) are not considered environmentally superior because construction of the sedimentation basin would result in the permanent loss of Important Farmland and the potential conversion of land under Williamson Act contracts to nonagricultural use, which is a significant impact. These impacts would not occur under the alternatives requiring pumped diversion (Alternatives 2, 3, 5, and 6) because the sedimentation basins would be located within the footprint of the SCH ponds, which would not be constructed on farmland. Of Alternatives 2, 3, 5, and 6, those located at the Alamo River (Alternatives 5 and 6) are not considered environmentally superior for a variety of reasons. Alamo River water includes higher levels of selenium than that of the New River. Although impacts from selenium would be less than significant, selenium would have adverse effects on wildlife, and lower levels would be preferable within the SCH ponds. Similarly, the Alamo River area is more geologically active than the New River area (mud pots are present adjacent to and within the Project area east of the Alamo River in Morton Bay), which could lead to an increased risk of berm failure. Although this impact is not considered significant, it would not be desirable and would result in temporary, but adverse impacts on SCH pond operation. The Alamo River area also is in a Known Geothermal Resource Area and known geothermal resources diminish west of the New River. Although the SCH Project would not preclude geothermal development, the New River area is considered preferable because the potential for conflicts with geothermal development companies would be minimized. Thus, Alternatives 5 and 6 were eliminated from consideration as the environmentally superior alternative.

Alternatives 2 and 3 would be located at the New River and would restore 2,670 and 3,770 acres of habitat, respectively. Alternative 3 would cause somewhat greater impacts during construction (and indirect air emissions during operations), but it would have greater long-term benefits because more habitat would be restored. The long-term benefits would offset the short-term, incremental increase in construction impacts (and incremental increases in power demand), and thus, Alternative 3 is considered the environmentally preferable/environmentally superior alternative.

ES1.15 PREFERRED ALTERNATIVE

The Natural Resources Agency has identified Alternative 3 as the preferred alternative because it would provide greater long-term benefits by restoring the greatest amount of habitat, while minimizing environmental impacts to the extent feasible. The Corps has not yet identified a preferred alternative.

ES1.16 AREAS OF KNOWN CONTROVERSY

The following are potential areas of controversy.

- **Water Supply**. Environmental groups have suggested that river water alone is a more appropriate water supply for the ponds instead than the combination of river water and seawater that is proposed. This is intended to minimize the need for pumping seawater, which would reduce operations and maintenance costs. Use of this water supply as a viable source is based on the premise that ecorisks from selenium exposure would not be significantly greater than those that exist under present conditions.
- **Method of Water Diversion**. Environmental groups have suggested that gravity diversion is preferable to pumped diversion of river water in order to minimize operations and maintenance costs and the demand for electrical power.
- **Potential Crop Loss**. Local farmers have expressed concern over the potential for crop loss at neighboring farms due to the presence of birds at the SCH ponds. This issue is addressed in Section 3.19, Socioeconomics.
- **Potential for Bird Airstrikes**. The U.S. Navy has expressed concern that the SCH Project, by itself and in combination with other projects, would attract and increase local bird populations and thus cause an increase in the potential for bird strikes by aircraft from the Naval Air Facility El Centro training ranges. This issue is addressed in Section 3.10, Hazards and Hazardous Materials.

ES1.17 ISSUES TO BE RESOLVED

The Corps has yet to identify its preferred alternative. The draft section 404(b)(1) alternatives analysis will be completed and included in the Final EIS/EIR. Based on this analysis, the Corps will choose the least environmentally damaging practicable alternative as the Corps' preferred alternative, which will be subject to public comment.

SECTION 1

INTRODUCTION

This Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) evaluates the impacts of alternative methods of implementing the Salton Sea Species Conservation Habitat Project (SCH Project or Project). The SCH Project is intended to serve as a proof of concept for the restoration of shallow water habitat that currently supports fish and wildlife dependent upon the Salton Sea (the Sea); this habitat is being lost due to salinity increases and the declining Sea elevation. This section of the EIS/EIR presents background and introductory information, and describes the authorities of the lead agencies (United States [U.S.] Army Corps of Engineers [Corps] and the California Natural Resources Agency) in preparing this EIS/EIR, the public outreach program, and the scope and contents of the EIS/EIR. This EIS/EIR has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code section 4341 et seq.), and in conformance with the Council on Environmental Quality NEPA guidelines and the Corps' NEPA Implementing Regulations. The document also fulfills the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) and the State CEQA Guidelines (Title 14, California Code of Regulations section 15000 et seq.). The Corps is the NEPA lead agency, and the California Natural Resources Agency is the CEQA lead agency. The EIS/EIR was prepared under the direction of the California Department of Fish and Game (DFG) and California Department of Water Resources (DWR) on behalf of the Natural Resources Agency and the Secretary for Natural Resources.

1.1 PROJECT LOCATION

The Project would be located at the southern end of the Salton Sea in Imperial County, California. Alternative sites for implementing the SCH Project are located near the mouths of the New and Alamo rivers (Figure 1-1).

1.2 BACKGROUND

The Salton Sea, located in southern Riverside and northern Imperial counties in Southern California, is California's largest lake. Although large seas have cyclically formed and dried over historic time in the basin due to natural flooding from the Colorado River, the current Salton Sea was formed when Colorado River floodwater breached an irrigation canal being constructed in the Imperial Valley in 1905 and flowed into the Salton Sink. The Sea has since been maintained by irrigation runoff in the Imperial and Coachella valleys and local rivers. Because the Sea is a terminal lake, increasingly concentrated salts have resulted in a salinity that is currently 50 percent greater than that of the ocean. The increasing salinity and other water quality issues, including temperature extremes, eutrophication, and related anoxia and algal productivity, are adversely influencing the Sea's fish and wildlife resources.

The Salton Sea functions both as a sump for agricultural runoff and an important wildlife area. The Imperial Valley has approximately 430,000 acres of farmland under cultivation that are irrigated with water from the Colorado River (Imperial Irrigation District [IID] 2010), while about 50,000 acres are farmed in the Coachella Valley (County of Riverside, Agricultural Commissioner's Office 2010).

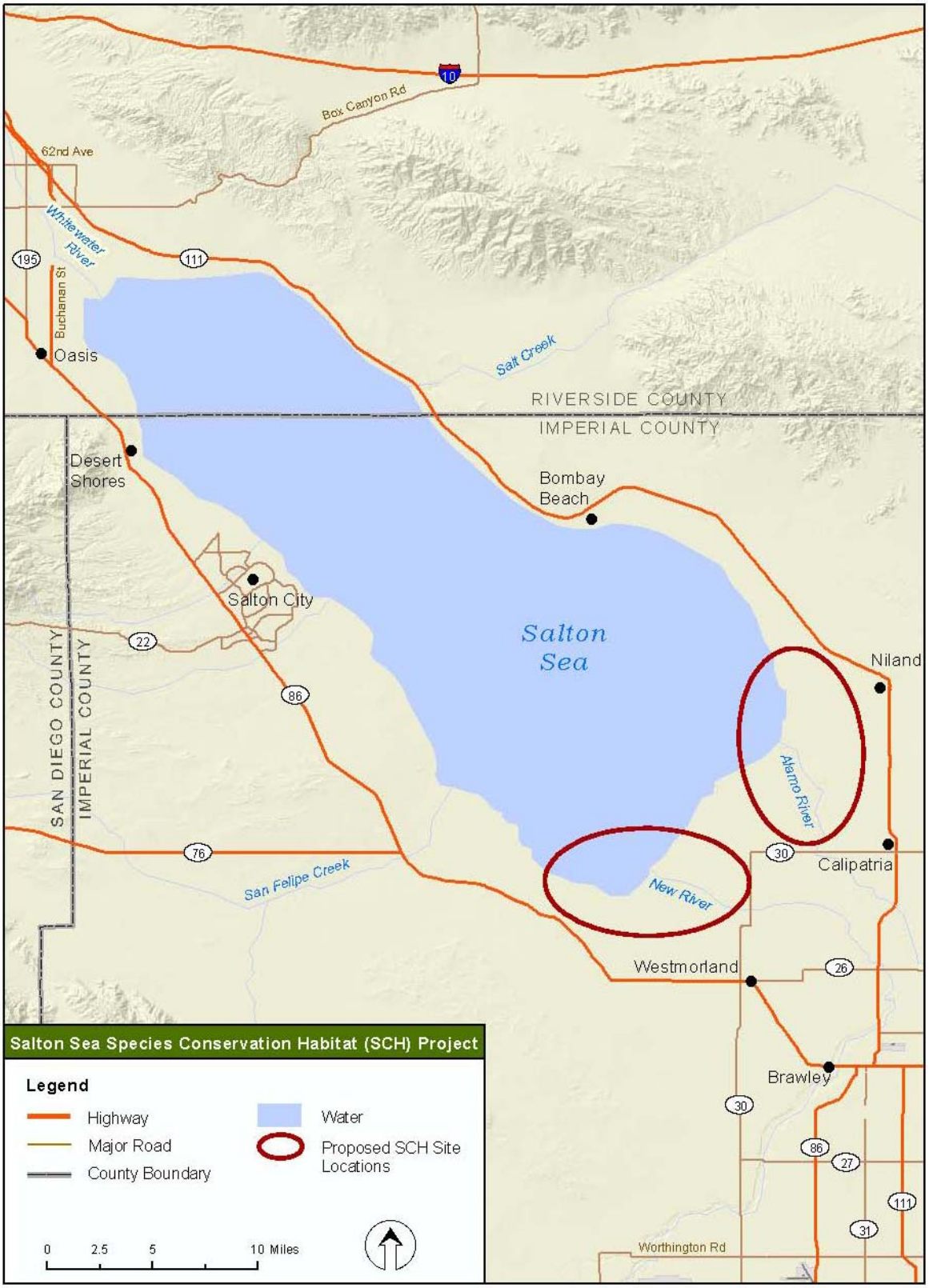

Figure 1-1 Regional Setting and Generalized Locations of SCH Alternative Sites

Although it has only existed for about 100 years, the Salton Sea has become an extremely critical resource for many species of resident and migratory birds, including several species of special concern, due to widespread loss of wetland habitat in the United States and Mexico.

Until recently, the Sea also supported a robust marine sport fishery that included orangemouth corvina (*Cynoscion xanthulus*), Gulf croaker (*Bairdiella icistia*), and sargo (*Anisotremus davidsoni*). Increasing salinity has eliminated the marine fishery, leaving only the euryhaline tilapia to provide sport fishing. Tilapia and several smaller nonsport fish species, of which only the endangered desert pupfish (*Cyprinodon macularius*) is native, currently sustain a number of bird species.

Declining inflows in future years will result in collapse of the Salton Sea ecosystem due to increasing salinity and other water quality issues, such as temperature, eutrophication, and related anoxia and algal productivity. Pileworms and barnacles, primary components of the Salton Sea food web, already appear to be impacted by deteriorating water quality. Tilapia, which is presently the primary forage species for piscivorous (fish-eating) birds at the Salton Sea, may be eliminated when salinity exceeds 60 parts per thousand (ppt). Salinity reached 50 ppt in 2008 and could exceed 60 ppt as early as 2018. Tilapia would likely continue to persist in areas of lower salinity where the rivers, creeks, and agricultural drains enter the Salton Sea. However, the loss of fish populations from the open water area would significantly reduce and possibly eliminate use of the Salton Sea by piscivorous birds, such as pelicans, double-crested cormorants, and black skimmers by the early 2020s. Some of these birds could use the areas where the rivers, creeks, and drains enter the Salton Sea if fish continue to persist in these locations. In addition, the relative abundance of bird species that forage on invertebrates likely would change over time with increases in salinity and resultant changes in the invertebrate community.

The Quantification Settlement Agreement (QSA)[1] is one of the factors contributing to declining inflows to the Salton Sea. California historically used more than its normal year apportionment of Colorado River water, obtaining the excess from water apportioned to Arizona and Nevada but not used by those states, and by water designated as surplus by the Secretary of the Interior. The amount of unused apportionment previously available to California has diminished, however, and is unlikely to be available in the future. After prolonged negotiations between the Federal government and the California water districts that have entitlements to Colorado River water, a series of agreements, collectively known as the QSA, were made among the Federal government, State of California, IID, Metropolitan Water District of Southern California , San Diego County Water Authority, and Coachella Valley Water District in October 2003. The QSA imposes water conservation measures within the IID service area to allow the transfer of this water elsewhere, which reduces the volume of agricultural runoff that constitutes the Salton Sea's chief source of water. IID is required to provide conserved water to the Sea to mitigate the effects of the transfer on salinity until 2017. After 2017, however, the Sea’s salinity is expected to exceed the tolerance limit for fish and, thus, mitigation for effects on salinity ceases at that time. The reduction in water to the Sea after 2017 is anticipated to result in loss of the fishery, exposure of soils to wind erosion, and bird declines due to loss of food. Reduction of inflows to the Sea from other factors, such as water recycling in Mexico, is also contributing to increases in salinity and a declining sea elevation.

1.3 CEQA PROJECT GOALS AND OBJECTIVES / NEPA PURPOSE AND NEED

The Salton Sea currently supports a wide variety of bird species and a limited aquatic community. Over many decades, the components of the aquatic-dependent community have shifted in response to receding water levels and increasing salinity. The Salton Sea is currently a hypersaline ecosystem (about 51 ppt)

[1] The Quantification Settlement Agreement is one of more than thirty agreements executed concurrently among certain Southern California water agencies in 2003. The State of California, the Federal government, and others signed some of the agreements. That set of agreements is commonly referred to as “the QSA.” One of those agreements, the QSA/Joint Powers Authority Creation and Funding Agreement, was invalidated on January 10, 2009 in Sacramento County Superior Court on constitutional grounds and is currently on appeal at the Third District Court of Appeal. The appellate court has not scheduled a hearing date.

(C. Holdren, Reclamation, unpublished data). Without restoration, declining inflows in future years will result in the Sea's ecosystem collapse due to increasing salinity (expected to exceed 60 ppt by 2018, which is too saline to support fish) and other water quality stresses, such as temperature extremes, eutrophication, and related anoxia due to algal productivity.

The most serious and immediate threat to the Salton Sea ecosystem is the loss of fishery resources that support piscivorous birds. The birds that feed on invertebrates have more options and resources, because the invertebrate fauna has a wider range of salinity tolerances. Piscivorous birds, on the other hand, are at risk of decline. To address this immediate need, the California Legislature appropriated funds for the purpose of implementing "conservation measures necessary to protect the fish and wildlife species dependent on the Salton Sea, including adaptive management measurements" (California Fish and Game Code section 2932(b)). Therefore, under CEQA the SCH Project's goals are two-fold: (1) develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea; and (2) develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process. The specific objectives associated with each of these goals are detailed below, along with the rationale for their selection.

Goal 1: Develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea.

First, the SCH Project's purpose is to provide in-kind replacement for near-term habitat losses. The Project's target species are those piscivorous bird species that use the Salton Sea and that are dependent on shallow saline habitat for essential habitat requirements and the viability of a significant portion of their population.

OBJECTIVES FOR GOAL 1:

Provide appropriate foraging habitat for piscivorous bird species – The SCH Project would provide sufficient prey necessary to support target piscivorous bird species. The prey would include fish of appropriate sizes and accessibility (not benthic fish that are difficult for birds to capture). The fish would include nonnative fish species that fulfill a key habitat function, such as introduced tilapia, which are currently the most abundant fish in the Salton Sea and the primary forage for piscivorous birds. The exact species composition of prey species is less critical than maintaining sufficient quantity of fish for target bird species (e.g., the size and location of prey items) because of the Sea's challenging (or narrow) parameters. The SCH Project also would have ancillary benefits for invertebrate-eating birds that use the Salton Sea such as eared grebe (*Podiceps nigricollis*), American avocet (*Recurvirostra americana*), and black-necked stilt (*Himantopus mexicanus*).

Develop habitats required to support piscivorous bird species – The SCH Project would develop appropriate physical structure and microhabitat elements to support life-history needs of target piscivorous bird species (e.g., islands for roosting and nesting, sufficient depth for different foraging needs). Habitat elements that are complementary for other aquatic bird species would be included where feasible and consistent, such as suitable slopes and substrate near shoreline for invertebrate-foraging birds. However, habitat components that are associated with the tributaries, drains, and surrounding agricultural lands (e.g., riparian habitat, freshwater wetlands) would not be incorporated.

Support a sustainable, productive aquatic community – A stable aquatic community is one that can recover and persist in the face of short-lived disturbances, with minimal change in species composition and/or food-web dynamics. A stable aquatic community has persistent populations of prey to support the community, as well as a variety of water-dependent birds. Maintaining a variety of prey species and prey life stages increases the likelihood of resilience and persistence in the face of harsh and variable environmental conditions. The Salton Sea aquatic food chain is characterized by limited diversity but high abundance (DWR and DFG 2007). Measures of the aquatic community's health include species

composition (individual species and functional guilds), population size of fish species, and age/size structure of population (indicator of demographic dynamics and reproduction).

Provide suitable water quality for fish – The Salton Sea typically experiences wide fluctuations in water temperature and dissolved oxygen on a daily or seasonal basis, variable salinities across spatial gradients, and high concentrations of nutrients from inflows. The SCH Project would be designed to attenuate variations in these parameters, to the extent feasible, to within a range that target aquatic species and their prey can survive and persist, and it would include habitat components that provide refugia, such as physical habitat structure and microhabitat diversity.

Minimize adverse effects on desert pupfish – Desert pupfish is a state and Federally listed species that occupies and moves among freshwater and brackish habitat in tributaries and drains surrounding the Salton Sea. The SCH Project would be designed to maintain connectivity among pupfish populations (i.e., not block movement via nearshore habitats that are currently used by pupfish). Desert pupfish would likely become established in the SCH ponds during construction. The ponds would be designed to minimize impacts on desert pupfish (e.g., the fish selected would be species that currently share pupfish habitat).

Minimize risk of selenium – Selenium is present in the freshwater supply, and also the sediments and soils in ponds and the Salton Sea. As a result of biological uptake, selenium could bioaccumulate in aquatic and terrestrial species, possibly resulting in reproductive impacts in birds that prey on fish and invertebrates. The SCH ponds would be designed to minimize risk of selenium bioaccumulation. Minimization measures being considered include managing salinity gradients in the ponds and sediment basin to interrupt selenium uptake by vegetation.

Minimize risk of disease/toxicity impacts – In the past, botulism and avian cholera have resulted in bird die-offs during some seasons at the Salton Sea. The SCH Project would be designed to minimize the potential for these occurrences, to the extent feasible. Measures include regular monitoring of fish and bird health for early intervention and incorporating easy access to remove sick and dead birds.

Goal 2: Develop and refine information needed to successfully manage the SCH Project habitat through an adaptive management process.

The SCH Project's second goal would be to serve as a proof of concept for the restoration of shallow water habitat that supports fish and wildlife currently dependent upon the Salton Sea. The Project would incorporate an adaptive management framework to guide evaluation and improved management of the newly created habitat as well as to inform future restoration. An adaptive management framework provides a flexible decision-making process for ongoing knowledge acquisition, monitoring, and evaluation, leading to continuous improvement in management planning and Project implementation to achieve specified objectives. The information obtained would be used to measure Project effectiveness, to refine operations and management of the ponds, to reduce uncertainties about key issues, and to inform subsequent stages of habitat restoration at the Salton Sea.

OBJECTIVES FOR GOAL 2:

Identify uncertainties in achieving the objectives of providing habitat and prey for piscivorous birds (e.g., maintaining suitable water temperature and dissolved oxygen) and minimizing impacts on species (e.g., selenium ecorisk).

Design science-based means to test alternatives and reduce uncertainty.

Develop and implement a monitoring plan – The monitoring plan would measure key indicators of SCH Project performance. Examples include measures of habitat (e.g., area, depth, physical structure, aquatic plant species/cover, water quality), target species (richness, diversity, abundance, habitat use), trophic function (e.g., composition and density of forage species), and stressors (e.g., water quality,

selenium). Other indicators of general ecosystem health may also be monitored to determine other ancillary benefits (e.g., to nonpiscivorous bird species) and/or stressors.

Develop a decision-making framework – The framework would evaluate data, adjust management, and refine operations and monitoring as needed to achieve Goal 1. Because not all the SCH ponds would be constructed at once, information from the first constructed ponds would be used to refine the design and operations of subsequent ponds.

Provide proof of concept for future restoration – Proof of concept would verify that the core ideas are functional and feasible prior to full-scale restoration of the Salton Sea. The SCH Project would help establish viability, technical issues, and overall direction, as well as providing feedback for costs and requirements of construction, operations, and management.

The purpose of the Project under NEPA is to develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea in Imperial County, California.

1.4 DRAFT SECTION 404(B)(1) ALTERNATIVES ANALYSIS BASIS AND OVERALL PROJECT PURPOSE

The Clean Water Act (CWA) section 404(b)(1) Guidelines (Guidelines) promulgated by the U.S. Environmental Protection Agency explain that, when an action is subject to NEPA and the Corps is the permitting agency, the analysis of alternatives prepared for NEPA will, in most cases, provide the information needed for analysis under the Guidelines. The Guidelines also state that, in some cases, the NEPA document may have addressed "a broader range of alternatives than required to be considered under [the Guidelines] or may not have considered alternatives in sufficient detail to respond to the details of these Guidelines. In the latter case, it may be necessary to supplement these NEPA documents with this additional information" (40 Code of Federal Regulations [CFR] section 230.10(a)(4)). In light of this statement in the Guidelines, and because the Project purpose statement under NEPA and the Guidelines are not necessarily identical, the Corps has reviewed and refined the Project purpose to ensure it meets the standards of the Guidelines.

For CWA section 404 purposes, the Draft Section 404(b)(1) Alternatives Analysis, to be included as an appendix in the Final EIS/EIR, provides the following statement of basis and overall project purpose:

> The basic project purpose comprises the fundamental, essential, or irreducible purpose of the proposed action, and is used by the Corps to determine whether an applicant's project is water dependent (i.e., whether it requires access or proximity to or siting within a special aquatic site). The basic project purpose for the SCH Project is aquatic habitat restoration. The SCH Project is water dependent. Therefore, the rebuttable presumptions that there is a less damaging practicable alternative for the proposed activity that would not affect jurisdictional waters do not apply (40 CFR section 230.10(a)(3)).

The overall Project purpose is to develop a range of aquatic habitats that will support fish and wildlife species dependent on the Salton Sea in Imperial County, California.

1.5 SPECIES SUPPORTED BY THE SPECIES CONSERVATION HABITAT PROJECT

1.5.1 Aquatic Species

Aquatic organisms that currently or in the recent past comprise the food web supporting fish in the Salton Sea include phytoplankton, zooplankton, and benthic and water column macroinvertebrates. Macroinvertebrate species include diptera (flies), corixids (water boatmen), benthic polychaetes such as pileworms (*Neanthes succinea*) and a spionid worm (*Streblospio benedicti*), amphipods (*Gammarus mucronatus* and *Corophium louisianum*), ostracods (seed shrimp), and a barnacle (*Balanus amphitrite*)

(Detwiler et al. 2002; Miles et al. 2009), while zooplankton is dominated by copepods (Miles et al. 2009). These or other species with similar habitat functions and food-web functions would become established or would be introduced into the SCH ponds.

Although a number of fish species were present in the Salton Sea while salinity was in the range of marine waters, those fish were introduced for recreational fishing and not as forage for birds. Tilapia that inhabit the Sea are hybrids between the Mozambique tilapia (*Oreochromis mossambicus*) and Wami River tilapia (*O. urolepis hornorum*) (Costa-Pierce 2001). These fish, called California Mozambique hybrids ("Mozambique hybrid tilapia"), are currently the most abundant fish in the Sea and have been extensively used as forage by birds because their size range and location within the water column makes them easily accessible.

To support piscivorous birds, the SCH Project would need to provide fish of a size and quantity that the birds can use. Many of the plankton and macroinvertebrate components of the aquatic food web that support the fish will be present in the water used to fill the SCH ponds and would multiply there. For species of macroinvertebrates that are no longer present or present in very low numbers (e.g., pileworms and barnacles), inoculation with those species (or species with similar ecological functions) would be considered. Fish species that are currently present, or have been present in the past, and that would be suitable for the SCH ponds include several species and hybrids of tilapia, sailfin molly (*Poecilia latipinnna*), and threadfin shad (*Dorosoma petenense*). These species have been selected as the most likely to survive and have the least potential for adverse effects on the desert pupfish. Other species could also be used, particularly if some of these do not become abundant enough to support bird foraging.

1.5.2 Piscivorous Birds

The SCH ponds are designed to accommodate those piscivorous bird species that will experience significant declines when the quality of Salton Sea habitat deteriorates substantially in the future. For many of these species, a significant proportion of their population uses the Sea. Examples of those focal species that the SCH ponds would support are shown in Table 1-1. If the amount of habitat used by these species at the Sea were substantially reduced, some individuals could use other habitats in the region up to their capacity, but it is unlikely that all of the piscivorous birds using the Sea could find suitable habitat elsewhere.

The SCH ponds would also benefit other bird species, such as the eared grebe, western snowy plover (*Charadrius alexandrinus nivosus)*, ruddy duck (*Oxyura jamaicensis*), black tern *(Chlidonias niger)*, and California brown pelican (*Pelecanus occidentalis*). These species are either not piscivorous (invertebrate prey is easier to support than fish) and/or only a small proportion of their population depends on the Salton Sea. Also, some subspecies or population segments would likely use the restored habitats as well, such as the least tern (interior subspecies of the California least tern or Mexican least tern, whichever is present at the Salton Sea) and the Baja population of the California brown pelican, which uses the Sea as a post-breeding site. While the SCH ponds would provide ancillary benefits for these species, they are not the principal species served by the SCH Project and, therefore, their habitat needs would not be considered criteria for design.

Table 1-1 Focal Species of Piscivorous Birds that Would Be Served by the Species Conservation Habitat Project

Species	Food	Notes
American white pelican (*Pelecanus erythrorhynchos*)	Fish	Thirty-three percent of the North American population winters at the Salton Sea; does not plunge-dive, but dips bill into water. Favors shallow bays with forage fish and exposed loafing sites. Forages on small to moderately large fish in shallow water 0.3 to 2.5 meters deep.
Black skimmer	Fish	Largest breeding population is at the Salton Sea. Colony nester in open sandy

Table 1-1 Focal Species of Piscivorous Birds that Would Be Served by the Species Conservation Habitat Project

Species	Food	Notes
(*Rynchops niger*)		areas or gravel or shell bars with sparse vegetation. Forages on small fish in water less than 20 centimeters deep within 2 meters of land.
Caspian tern (*Hydroprogne caspia*)	Fish	Largest breeding population is at the Salton Sea. Forages on small fish by plunge-diving, typically along coast or shoreline over waters 0.5 to 5 meters deep. Colony nester among driftwood and debris on low flat sandy or rocky islands.
Double-crested cormorant (*Phalacrocorax auritus*)	Fish	Largest breeding population at the Salton Sea. Dive from surface and hunt for relatively small fish underwater. Forage in shallow water less than 8 meters, typically less than 30 kilometers from colony. Nest in large colonies. May nest on mats of emergent vegetation and may nest in trees standing in or near water.
Gull-billed tern (*Gelochelidon nilotica*)	Fish (40 percent), lizards, invertebrates, and chicks of other species	Breeds at two locations in the western portion of the United States: San Diego Bay and the Salton Sea. Up to 200 pairs are estimated to have nested at the Salton Sea recently, predominately at Morton Bay and Mullet Island (personal communication, K. Molina 2010).

1.6 DEVELOPMENT OF THE SALTON SEA SPECIES CONSERVATION HABITAT PROJECT

Several reports have suggested the use of constructed habitat to replace habitat that will be lost as the salinity continues to increase and the surface water elevation decreases in the Salton Sea. In addition, some current projects at the Sea have developed shallow water habitats that provide at least some of the Sea's habitat benefits. The concept of SCH evolved from the ideas and concepts in these reports and projects.

1.6.1 Salton Sea Restoration Program

The Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report (PEIR) (DWR and DFG 2007) identified the need for shallow saline habitat to replace habitat values that would be lost as the Salton Sea became more saline and receded due to reduced inflows. The saline habitat would be created by mixing seawater with drainwater, which was suggested as a possible means to help reduce the selenium concentrations in the drainwater to be used as the water supply. The shallow habitat was termed Saline Habitat Complex and Early Start Habitat. These shallow water complexes are part of the Preferred Alternative that was presented to the California Legislature in May 2007. However, the California Legislature has not taken any action to approve or provide funding for any alternative for restoration of the Salton Sea ecosystem.

Early Start Habitat was defined as a temporary feature consisting of 2,000 acres of pond habitat constructed between elevations -228 to -232 feet mean sea level along the southern shoreline where the flat slope of the seabed would provide a large area for the shallow water cells. Agricultural drains in this area could provide a stable source of inflows into the Early Start Habitat. Saline water from the Sea would be mixed with fresher water from the drains to provide salinity between 20 to 60 ppt. The 2,000 acres of habitat would be divided into cells with dikes constructed from excavated seabed materials. Average water depths within each cell would be less than 4 feet. The PEIR assumed that the Early Start Habitat could be implemented before 2011, following approval of the Preferred Alternative by the California Legislature, if easements or deeds could be acquired. The SCH Project is consistent with the description of Early Start Habitat identified in the PEIR.

Saline Habitat Complex would be permanent habitat ranging in acreage from 38,000 acres for Alternative 1 to 75,000 acres for Alternative 2 of the PEIR. The Preferred Alternative identified 62,000 acres of Saline Habitat Complex. Each pond in the complex would be 1,000 acres in size, with salinity in the ponds ranging from 20 to 200 ppt. Water depth would be up to 4 feet deep, with deeper holes up to 15 feet deep.

1.6.2 Bureau of Reclamation Restoration of the Salton Sea

Shortly after release of the PEIR, the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) released the report entitled *Restoration of the Salton Sea* (2007). Reclamation identified a Progressive Habitat Development Alternative as a recommended future course of action by the Federal government for potentially restoring historical wildlife values at the Sea. This alternative would provide a successive and phased approach to developing habitat. Each phase could include between 200 and 500 acres of Saline Habitat Complex, with engineering designs and wildlife management criteria and strategies derived from a previous phase. Detailed evaluations concerning water quality, habitat values and use, biologic issues, and engineering performance would be continuous. The information obtained would be used to refine the design and adaptive strategies for the next phase of complexes. The adaptive and flexible strategies would reduce risks and uncertainties associated with operating larger complexes. Actual habitat values would be determined through continuous observations and study, while habitat areas could continue to be added up to what is determined to be historic values at the Sea.

The maximum buildout of habitat acreage would be dependent upon the success of developing adaptive and flexible strategies for managing or mitigating observed problems, risks, and uncertainties. This phased approach would allow for studying adaptations of embankment and water conveyance designs and construction methods to determine the most cost-effective methods. Each phase of design and construction would rely on lessons learned from previous phases. Reclamation is providing technical assistance to the Salton Sea Authority and the Natural Resources Agency on habitat development.

1.6.3 U.S. Geological Survey/Reclamation Saline Habitat Ponds

The U.S. Geological Survey (USGS) and Reclamation developed saline habitat ponds (SHP) at the Salton Sea's southern end in 2006. Objectives of the study were to evaluate (a) avian use and species diversity; (b) nesting success and post-hatch survival of black-necked stilts; (c) risk of reproductive impairment associated with egg selenium concentrations; (d) water, sediments, and aquatic invertebrate response to blended water; and (e) construction techniques and the durability of levees and islands. The 100-acre project, decommissioned in 2010, was divided into four 25-acre ponds less than 2 feet deep. Water pumped from the Salton Sea was mixed with water from the Alamo River in an attempt to maintain salinities in the series of ponds between 20 and 60 ppt. Extensive monitoring was conducted to determine pond colonization by phytoplankton and invertebrates, bird use, and water quality. The ponds attracted a number of bird species that fed on the invertebrates and fish produced in the ponds. A key product from the study was an ecological risk assessment of adverse affects on avian populations inhabiting the SHP (Miles et al. 2009).

1.6.4 Torres Martinez Ponds

The Torres Martinez Desert Cahuilla Indian Tribe (Torres Martinez Tribe) has constructed a series of shallow freshwater habitat ponds at the Salton Sea's northern end using flow from the Whitewater River. The purpose of the initial ponds was to treat river water to remove contaminants, such as fertilizers, pesticides, and bacteria. The 85 acres of freshwater ponds have been successful in creating habitat used by a wide variety of wildlife, including over 130 bird species, due in large part to the presence of robust fish populations that have developed in the ponds. The ponds provide additional opportunity to obtain information about wetland design and implementation at the Salton Sea. Additional ponds are being planned that should provide increased habitat for a wide variety of bird and other wildlife species.

1.6.5 Species Conservation Habitat Project's Relationship to Other Projects

Although the ponds developed by the Torres Martinez Tribe provide habitat for fish and wildlife, the limited acreages are not sufficient to offset the many thousands of acres of habitat expected to be lost over the next few years as the Salton Sea ecosystem degrades. As such, the SCH Project is needed to achieve larger-scale, long-term habitat benefits that can offset some of the anticipated habitat losses that will soon occur at the Sea. In addition, creation of SCH ponds would provide an opportunity to address numerous issues and uncertainties at the proof-of-concept scale.

The SCH Project draws on the concepts contained in the PEIR for Early Start Habitat and Saline Habitat Complex, Reclamation's Progressive Habitat Development Alternative, the USGS/Reclamation SHP, and the Torres Martinez Tribe ponds. The SCH Project's purpose is to provide some of the "conservation measures" needed to replace declining fish and wildlife habitat at the Salton Sea. Considering the success of existing smaller projects, it is reasonable to expect that the larger SCH Project would provide suitable habitat for invertebrates, fish, and birds, especially because a more varied and robust set of habitat features would be incorporated in the design. Preliminary findings from the SHP and habitat ponds developed by the Torres Martinez Tribe demonstrate that creation of shallow ponds can provide habitat for the fish and wildlife that are dependent on the Sea.

1.7 ENVIRONMENTAL REVIEW PROCESS

Public scoping was conducted to help identify areas of concern and specific issues that should be addressed in the EIS/EIR. In compliance with NEPA, the Corps issued a Notice of Intent for the preparation of the EIS/EIR on June 23, 2010. In compliance with CEQA, the Natural Resources Agency issued a Notice of Preparation for the EIS/EIR on June 21, 2010. These notices are included in Appendix A, Scoping Process. The notices were sent to over 1,300 responsible and involved agencies and interested organizations and individuals. To solicit additional comments on the scope and content of the EIS/EIR, the lead agencies held four public scoping meetings in Palm Desert, Thermal, Calipatria, and Brawley on July 7 and 8, 2010. The four scoping meetings attracted over 50 people, some of whom provided oral comments on the scope and content of the EIS/EIR, including Project design and impacts. Twelve written responses to the notices were received during the comment period which ended on July 24, 2010. The most common topics mentioned included the Project description, water supplies, adaptive management, siting criteria, baseline conditions, resource-specific impacts and mitigation measures, as well as impacts of expanding the range of species that would be benefited by the SCH Project, addressing issues associated with selenium exposure, and the need to address the potential creation of breeding habitat for mosquitoes, which are disease vectors. Additionally, a number of commenters, including the U.S. Environmental Protection Agency, Reclamation, San Diego County Water Authority, and a group of non-governmental organizations, expressed overall support for the SCH Project. The information from scoping was used to shape the scope, content, and level of detail in the EIS/EIR and in all phases of document preparation. A complete description of the scoping process and comments received is included in the scoping report provided in Appendix A.

1.8 PURPOSE OF THE EIS/EIR

This joint EIS/EIR is intended to identify to agency decision makers and the public the potential range of impacts associated with the implementation of the Project alternatives, including significant and beneficial environmental impacts. As described below, each of the lead agencies has independent regulatory compliance needs that are served by this EIS/EIR.

1.8.1 NEPA and the Purpose of an EIS

NEPA requires decision makers from Federal agencies to document and consider the impacts on the environment from their actions before making decisions and take actions that protect, restore, and enhance the environment. An EIS is prepared when an agency determines that an action could result in one or more significant impacts on the environment in order to provide a full disclosure of anticipated

impacts. The EIS informs decision-makers and the public of reasonable alternatives that would avoid or minimize significant impacts or enhance the quality of the human environment.

1.8.2 CEQA and the Purpose of an EIR

CEQA requires state and local agency decision makers to consider the environmental consequences of their actions. An EIR is prepared when such agencies determine that a project has the potential to result in one or more significant environmental impacts. The purpose of an EIR is to identify the environmental impacts resulting from a project, identify alternative ways of implementing a project that could reduce or avoid significant impacts, and identify ways in which significant impacts can be reduced or avoided. When feasible mitigation measures do not exist, a project may still be carried out if the approving agency finds that economic, legal, social, technological, or other benefits outweigh the unavoidable significant impacts.

1.9 INTENDED USES OF THE DRAFT EIS/EIR

The Draft EIS/EIR has been prepared in accordance with applicable Federal and state environmental statutes, regulations, and policies and is intended to inform Federal and state decision makers regarding the potential impacts of the Project alternatives and help them identify the preferred alternative. The Draft EIS/EIR is an informational document and does not recommend approval or denial of the Project. The Draft EIS/EIR is being provided to the public in order to obtain comments on the scope and impacts of the Project alternatives. A Final EIS/EIR will be prepared that takes into consideration comments received from agencies, organizations, and individuals; and responses to each comment will be provided. The Final EIS/EIR will be the basis for decision making by the Corps, the Natural Resources Agency, and other concerned agencies.

1.9.1 Corps' Use of the EIS/EIR

The Corps will use this EIS/EIR in determining whether to issue a Department of the Army permit for the SCH Project under section 404 of the CWA. The EIS/EIR will also support the Corps' consultations with the California State Historic Preservation Office regarding potential impacts on cultural resources and with the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts on endangered species. The Corps will issue a Record of Decision that documents its decision on the preferred alternative pursuant to its regulatory authority under section 404 of the CWA.

1.9.2 Natural Resources Agency's Use of the EIS/EIR

The Natural Resources Agency will use the EIS/EIR in deciding whether to approve and implement the preferred alternative and also will use the EIS/EIR as the basis for its applications for approval under section 401 and 404 of the CWA and other required permits. The Natural Resources Agency will certify the EIR, as appropriate, and issue a Notice of Completion, Findings of Fact, and Statement of Overriding Considerations (if necessary) that will document its decision regarding the adequacy of the EIR.

1.9.3 Cooperating, Responsible, and Trustee Agency Actions

Under NEPA, cooperating agencies are agencies other than the lead agency that have discretionary authority over a proposed action, jurisdiction by law, or special expertise with respect to the environmental impacts expected to result from an action. Reclamation is a cooperating agency for the preparation of this EIS/EIR and has special expertise related to restoration planning, as well as jurisdiction by law over lands located near the Project area. The USFWS also is a cooperating agency because portions of the ponds at the New River sites would be located on land that is part of Sonny Bono Salton Sea National Wildlife Refuge and managed by the USFWS.

Under CEQA, responsible agencies are all agencies other than the lead agency that have discretionary approval power over a project. DFG will use the EIS/EIR in deciding whether to issue a Streambed Alteration Agreement under section 1602 or 1605 of the California Fish and Game Code and Incidental

Take Permit under section 2081 of the California Endangered Species Act. IID also is a responsible agency because the SCH Project primarily would be located on land that is owned by IID. The Colorado River Basin Regional Water Quality Control Board is a responsible agency because it would be required to issue a CWA section 401 water quality certification.

The California State Lands Commission (SLC) is a trustee agency, defined in section 15386 of the CEQA Guidelines as "...a state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California." The SLC will use the EIS/EIR in determining whether to issue a lease agreement for impacts on the Salton Sea for any portion of the SCH Project within its jurisdiction. The SLC has determined that one parcel included in the potential SCH Project sites is within its jurisdiction. Parcel 010-020-030, shown on Figure 1-2, is located within the Alternatives 4 and 6 sites, and its use would require a lease agreement with the SLC.

1.10 REQUIRED PERMITS AND CONSULTATIONS

The following permits and consultations are expected to be required:

- Federal CWA section 404 Standard Individual Permit from the Corps;
- Federal CWA section 401 water quality certification from the Colorado River Basin Regional Water Quality Control Board;
- National Historic Preservation Act section 106 consultation with State Historic Preservation Office;
- Federal Endangered Species Act section 7 consultation with the USFWS;
- California Fish and Game Code section 1602 or 1605 Streambed Alteration Agreement from DFG;
- California Endangered Species Act section 2081 Incidental Take Permit from DFG;
- SLC lease agreement for impacts on the Salton Sea for the use of parcel 020-010-030; and
- IID Board approval of the SCH Project lease agreement.

Additionally, the Imperial County Air Pollution Control District would require preparation of a Fugitive Dust Control Plan under Regulation VIII, Fugitive Dust Rules (800–806). Easements would be required from landowners for Project facilities during construction and operations. Haul permits and encroachment permits may be required for the use of area roadways during construction.

1.11 DOCUMENT ORGANIZATION

The EIS/EIR is organized as follows:

- **Chapter 1, Introduction** provides background on the Salton Sea and relevant legislation, and describes the purpose of and need for the Project, goals and objectives, targeted bird species, other projects considered in the development of the SCH Project, environmental review process, uses of the EIS/EIR, and required actions and permits.
- **Chapter 2, Alternatives** describes the alternatives development process, the No Action Alternative, and the six Project alternatives carried forward for detailed analysis.
- **Chapter 3, Affected Environment, Impacts, and Mitigation Measures** describes the current conditions and environmental impacts of the No Action Alternative and Project alternatives. Mitigation measures to reduce significant impacts to a less than significant level are proposed whenever feasible.
- **Chapter 4, Cumulative Impacts** addresses the combined impacts of the Project alternatives and other closely related projects.

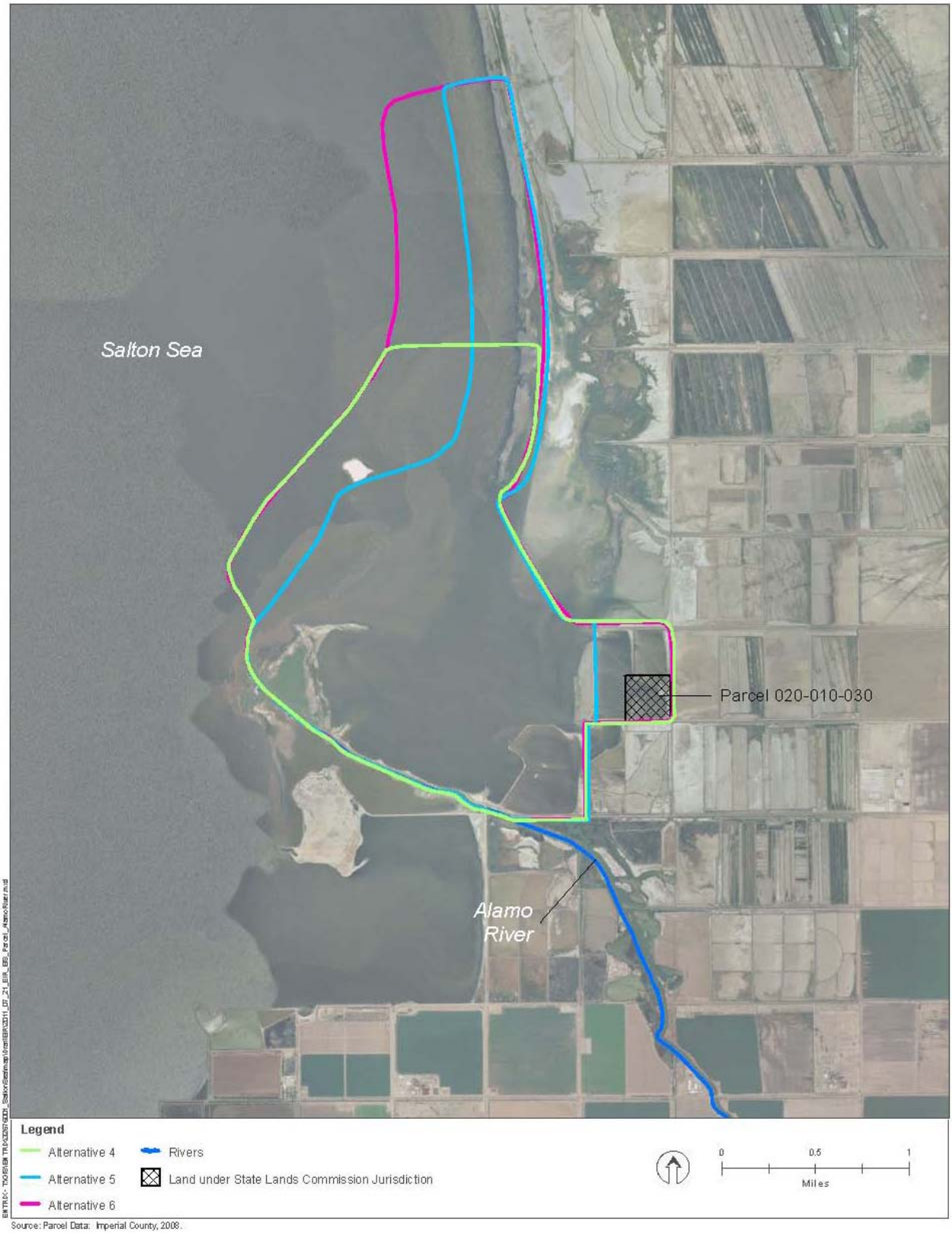

Figure 1-2 Portion of SCH Sites under State Lands Commission Jurisdiction

- **Chapter 5, Other Sections Required by NEPA and/or CEQA** includes growth-inducing impacts, the relationship between short-term uses of the environment and long-term productivity, irreversible and irretrievable commitments of resources, and a list of significant, unavoidable impacts.
- **Chapter 6, Compliance, Consultation, and Coordination** includes a discussion of regulatory compliance, consultation, and coordination.
- **Chapter 7, Summary Comparison of Alternatives** provides a comparison of the Project alternative compared to the existing environmental setting and the No Action Alternative.

The remaining sections include a list of references and persons/agencies contacted, definitions of acronyms and a glossary of technical terms, and a list of preparers.

The EIS/EIR also includes the following appendices:

A – Scoping Process

B – Alternatives Development Process

C – Geotechnical Investigations

D – Conceptual Project Operations

E – Monitoring and Adaptive Management Framework

F – Mosquito Control Plan

G – Air Quality Documentation

G1 – Imperial County Air Pollution Control District, Regulation VIII, Fugitive Dust Control Measures

G2 – Air Quality Emissions Calculations

H – Special-Status Species Evaluated but not Affected by the SCH Project

I – Selenium Management Strategies

J – Summary of Special Studies Supporting the EIS/EIR Impact Analysis

K – Tribal Consultation and Coordination

1.12 SCOPE AND CONTENTS OF THE DRAFT EIS/EIR

This Draft EIS/EIR includes all of the sections required by NEPA and CEQA. The scope of the Federal review is normally defined by 33 CFR part 325, Appendix B, which states: "…the district engineer should establish the scope of the NEPA document to address the impacts of the specific activity regarding the Department of the Army permit and those portions of the entire project over which the district engineer has sufficient control and responsibility to warrant Federal review."

The Corps' regulations require the Corps to determine if their "scope of review" or "scope of analysis" should be expanded to account for indirect and/or cumulative effects of the issuance of a permit (33 CFR part 325, Appendix B). Typical factors considered in determining "sufficient control and responsibility" include:

- Whether or not the activity constitutes merely a link in a corridor-type project;
- Whether aspects of the upland facility in the immediate vicinity of the regulated activity affect the location and configuration of the regulated activity;
- Extent to which the entire project will fall within Corps jurisdiction; and

- Extent of Federal cumulative control and responsibility.

Based on 33 CFR part 325, Appendix B, the appropriate scope of analysis for the Federal review of the selected action consists of the entire Project footprint.

Additionally, U.S. Environmental Protection Agency section 404(b)(1) Guidelines require the Corps to issue a permit only for the "least environmentally damaging practicable alternative," which is the most practicable alternative that would result in the least damage to aquatic resources. The factors that influence whether an alternative is practicable include cost, logistics, technology, and the ability of the alternative to achieve the overall project purpose. The section 404(b)(1) Guidelines focus on the impacts on the aquatic environment of discharges of dredged or fill material in waters of the U.S. As such, the scope of the section 404(b)(1) analysis is typically narrower than that of the NEPA analysis and could reach different conclusions regarding the practicability of an alternative.

The section 404(b)(1) Guidelines (40 CFR section 230) state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge that would have a less significant impact on the aquatic ecosystem, so long as the alternative does not have other significant environmental consequences (40 CFR section 230.10[a]). A section 404(b)(1) evaluation typically includes the following type of analysis:

- Factual determinations (e.g., on the physical substrate, water circulation, fluctuation, and salinity, suspended particulates/turbidity, contaminants, aquatic ecosystem and organisms, proposed disposal sites, and cumulative effects on the aquatic ecosystem);
- Findings of compliance or noncompliance with restrictions on discharge, including evaluation of the availability of practicable alternatives that would have a less significant impact on the aquatic ecosystem, and compliance with a variety of regulations (e.g., applicable state water quality standards, toxic effluent standards or prohibitions under section 307 of the CWA, the Federal Endangered Species Act, and the Marine Protection, Research and Sanctuaries Act);
- Identification of practical steps taken to minimize potential significant impacts of the discharge on the aquatic ecosystem; and
- Conclusion about the compliance of the proposed Project with the section 404(b)(1) Guidelines.

The information presented in this Draft EIS/EIR specific to impacts on the aquatic environment would be used by the Corps as part of any proposed permit action subject to section 404 of the CWA.

The following issues have been determined to be potentially significant and, therefore, are evaluated in this Draft EIS/EIR.

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy Consumption
- Environmental Justice
- Geology and Soils
- Greenhouse Gas Emissions

- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Noise
- Paleontological Resources
- Population and Housing
- Public Services
- Recreation
- Socioeconomics
- Transportation
- Utilities and Service Systems

This Draft EIS/EIR has been prepared by Cardno ENTRIX, Dudek, Ducks Unlimited, Chambers Group, Inc., and the University of California, Riverside under contract to DWR. It has been reviewed independently by the Corps and Natural Resources Agency staff. The scope of the document, methods of analysis, and conclusions represent the independent judgments of the Corps and the Natural Resources Agency. Staff members from the Corps, Natural Resources Agency, DFG, DWR, and those contractors who helped prepare this Draft EIS/EIR are identified in Section 9, List of Preparers.

1.13 REFERENCES

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California Department of Water Resources (DWR) and California Department of Fish and Game (DFG). 2007. Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report.

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1.14 PERSONAL COMMUNICATIONS

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SECTION 2

ALTERNATIVES

This section describes the alternatives development process, the alternatives that were carried forward for detailed analysis, and those that were eliminated from further consideration. Additional detail regarding the alternatives development process is included in Appendix B.

2.1 Regulatory Requirements

The goals and objectives/purpose for a project could be met in a variety of ways. However, these alternative ways of implementation would likely differ in how well they achieved project objectives/purpose, their feasibility, and their impacts. The approach and requirements for alternatives analysis are slightly different under Federal and state law.

Both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA) require that an Environmental Impact Statement (EIS) or Environmental Impact Report (EIR), respectively, analyze the impacts of alternative ways of implementing a project. NEPA's requirements for an alternatives analysis are found in the Council on Environmental Quality's NEPA Regulations (40 Code of Federal Regulations [CFR] 1502.14), and CEQA's are found in CEQA Guidelines section 15126.6. Under NEPA, the range of alternatives required to be evaluated by an EIS is governed by the rule of reason, which requires an EIS to set forth only those alternatives necessary to permit a reasoned choice. An EIS must rigorously explore and objectively evaluate a reasonable range of alternatives as defined by the specific facts and circumstances of the proposed action. Alternatives must be feasible and consistent with the statement of purpose and need. Feasible alternatives are those that can be carried out based on technical, economic, and environmental factors, as well as common sense (40 CFR 1502.14; Forty Most Asked Questions Concerning CEQ's NEPA Regulations No. 2a). If alternatives have been eliminated from detailed study, the EIS must briefly discuss the reasons for their elimination. In addition, under NEPA, the alternatives analysis should present the environmental impacts of the proposed project and the alternatives "in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public" (40 CFR section 1502.14). The "No Federal Action" alternative (referred to as the No Action Alternative in this document) must be included among the alternatives analyzed. The Federal lead agency also should identify its preferred alternative.

In addition to the NEPA alternatives analysis, the United States Army Corps of Engineers (Corps) is required to analyze alternatives pursuant to the Clean Water Act section 404(b)(1) Guidelines (40 CFR Part 230). Under those guidelines, the Corps is required to identify and determine the "least environmentally damaging practicable alternative." A Draft Section 404(b)(1) Alternatives Analysis for the proposed project will be prepared pursuant to the guidelines and included in the Final EIS/EIR. The Draft Section 404(b)(1) Alternatives Analysis is intended to assist the Corps in complying with the guidelines in connection with its decision whether to issue a Clean Water Act section 404 permit for the proposed project or an alternative to the proposed project. Pursuant to the Section 404(b)(1) Guidelines and Corps regulations (33 CFR 320-332), the Corps can issue a permit only for a project that is the least environmentally damaging practicable alternative (focusing primarily on impacts on aquatic resources) and is not contrary to the public interest.

CEQA requires that EIRs examine a reasonable range of alternatives that would feasibly achieve most of the basic project objectives, but would avoid or substantially lessen one or more of a project's significant environmental impacts. Project alternatives must be feasible based on specific economic, social, legal, and technical considerations. The EIR must explain the rationale for selecting the alternatives to be discussed, identify those that were eliminated as infeasible, and briefly explain why they were eliminated. The range of alternatives required in an EIR is governed by a "rule of reason," which requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The EIR need examine in detail only the alternatives that the lead agency determines could feasibly attain most of the project objectives (CEQA Guidelines section 15126.6[f]). An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative (CEQA Guidelines section 15126.6[f][3]).

CEQA Guidelines section 15126.6[e][1] indicates that the no project alternative (referred to as the "No Action Alternative" in this document) is not the baseline for determining whether the proposed project's environmental impacts may be significant unless it is identical to the existing environmental setting. CEQA Guidelines section 15126.6[e][2] further indicates that the no action analysis should discuss the existing conditions at the time the Notice of Preparation is published, as well as what would be reasonably expected to occur in the foreseeable future if the action were not approved, based on current plans and consistent with available infrastructure and community services.

2.2 Alternatives Development

Alternatives development for the SCH Project involved refining Project goals and objectives; identifying potential site locations, configurations, and Project components; and applying exclusionary and evaluative criteria. A detailed discussion of the alternatives development process is included in Appendix B. The California Department of Fish and Game (DFG) and California Department of Water Resources (DWR) initially identified three generalized locations for the SCH ponds, based on the potential availability of contiguous acreage (the initial target was 2,400 acres of saline habitat based on preliminary cost estimates and available funding) and the potential availability of a nearby, suitable water supply. The most suitable areas initially identified were located near the mouths of the New, Alamo, and Whitewater rivers (Figure 2-1).

Initial review identified only about 900 acres of land that potentially were available at the Salton Sea's northern end near the Whitewater River, while larger areas were identified at the Sea's southern end near the New and Alamo rivers. Therefore, several acreage combinations were developed using one or more of the rivers, resulting in habitats that would be contiguous or dispersed. The range of initial concept SCH configurations and approximate acreages included:

- Contiguous SCH ponds at the Whitewater River (900 acres)
- Contiguous SCH ponds at the New River (2,400 acres)
- Contiguous SCH ponds at the Alamo River (2,400 acres)
- Dispersed SCH ponds at the New and Alamo rivers (4,800 acres)
- Dispersed SCH ponds at the Whitewater and New rivers (3,300 acres)
- Dispersed SCH ponds at the Whitewater and Alamo rivers (3,300 acres)
- Dispersed SCH ponds at the Whitewater, New, and Alamo rivers (5,700 acres)

Criteria were developed to rank and screen sites and Project components where appropriate. This process was done through a combination of exclusionary criteria and evaluative criteria.

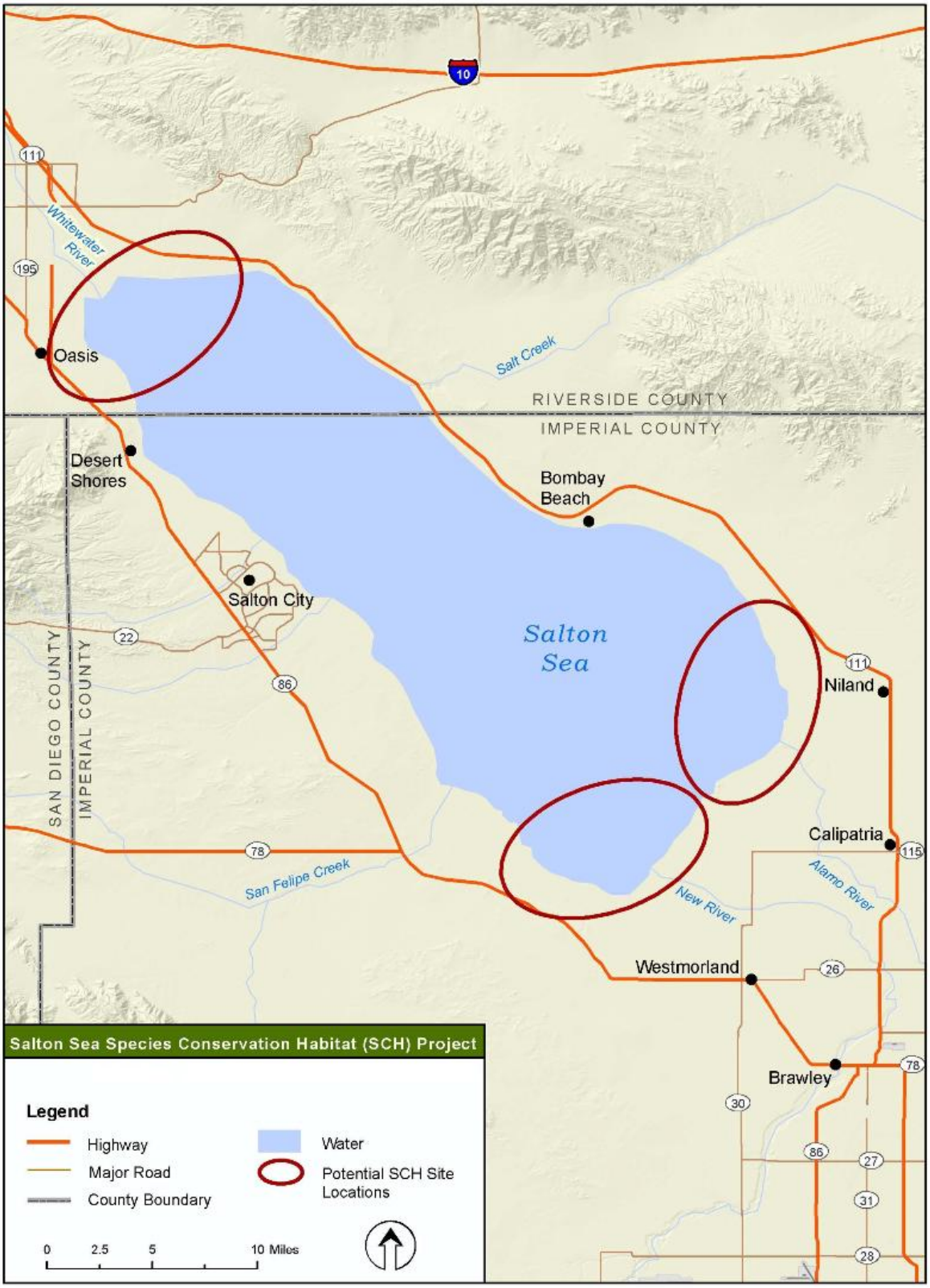

Figure 2-1 Initial Conceptual Locations for SCH Ponds

2.2.1 Exclusionary Criteria

Exclusionary criteria relate to those factors essential to successful Project completion: (1) available water rights; (2) available land (ownership and accessibility); and (3) adequate water supply (quantity, quality, and seasonal availability). Those potential sites and Project components that either did not meet the goals and objectives/purpose and need or were not feasible or practicable due to cost, technical, or environmental considerations were eliminated from further consideration. The screening analysis is summarized below:

Exclusionary criteria relate to those factors essential to successful Project completion: (1) available water rights; (2) available land (ownership and accessibility); and (3) adequate water supply (quantity, quality, and seasonal availability). Those potential sites and Project components that either did not meet the goals and objectives or were not viable due to cost, technical, or environmental considerations were eliminated from further consideration. The screening analysis is summarized below:

1. **Available water rights**. The Whitewater River is designated by the State Water Resources Control Board as a fully appropriated stream from the Salton Sea to the headwaters; thus, no water would be available for the SCH Project. The New and Alamo rivers are not designated as fully appropriated. Metropolitan Water District of Southern California has applications pending for appropriative rights for essentially all the available water in both New and Alamo rivers, but has not prepared the required environmental document for these water rights applications, and so the State Water Resources Control Board has not acted upon these applications.
2. **Available land**. Adequate land appears to be available at the New and Alamo rivers, owned primarily by Imperial Irrigation District (IID), although the land in the Wister Beach area is owned by multiple private parties. At the Whitewater River, land owned by the Torres Martinez Desert Cahuilla Indian Tribe (Torres Martinez Tribe) would be required to convey water to ponds, and available land for the SCH Project is limited.
3. **Adequate water supply**. Assuming 6 feet of evaporation annually, the amount of water necessary to supply the SCH ponds each year ranges from 5,400 acre-feet for 900 acres of SCH ponds to 34,200 acre-feet for 5,700 acres of SCH ponds (this water is lost to evaporation and does not include water that is circulated in the ponds to maintain salt balance or discharged to the Sea to flush ponds). Adequate water is available in the New and Alamo rivers, but not the Whitewater River due to existing and projected demands by the Coachella Valley Water District (CVWD) and the Torres Martinez Tribe.

   Water from agricultural drains has poorer water quality than that in the New and Alamo rivers; it is an unreliable supply that varies seasonally and may diminish over time as conservation increases. The drains also are habitat for desert pupfish (*Cyprinodon macularius*), a protected species. Available information indicates that adequate groundwater may not be available to supply the Project; thus, the Salton Sea's use as a source of saline water is considerably more preferable.

Based on this evaluation, sites at the Whitewater River were eliminated due to lack of water supply and available land. Drainwater and groundwater also were eliminated as potential water supplies.

2.2.2 Evaluative Criteria

A list of potential Project components was developed, representing different ways that the SCH Project could be implemented. These components are not alternatives; rather, they are elements that could potentially be included in an alternative. Components considered included:

- Diversion Mechanisms
  - Inline weir in river (brackish water)
  - Lateral weir in river (brackish water)
  - Pump water from the river (brackish water)
  - Pump saline water from the Salton Sea
- River Water Conveyance
  - Open canal
  - Brackish water pipeline
  - Combination
- Saline Water Conveyance
  - Pipeline
  - Backwater channel
- Suspended Sediment Management
  - Sedimentation basin near diversion
  - Sedimentation basin near SCH ponds
  - No sediment management
- Power Supply
  - Three-phase power
  - Diesel generator
  - Solar power

Evaluative criteria were applied next to determine which types of components would be included in the alternatives carried forward for evaluation. The criteria included (1) engineering feasibility and constructability; (2) relative cost-effectiveness (including capital cost and operations and maintenance) measured as cost per acre; (3) potential for physical environmental impacts; (4) compatibility with existing and planned land uses; and (5) ability to meet SCH Project schedule. Components were eliminated or refined based on these criteria. This process is described in detail in Appendix B.

Based on this analysis, six initial conceptual alternatives were developed that included two different locations and two methods of diverting and conveying the water to the SCH ponds. These alternatives would comply with NEPA and CEQA requirements to evaluate a reasonable range of alternative ways of implementing a project and CEQA's requirement to identify alternatives that would avoid or substantially lessen one or more of a project's significant environmental impacts.

For example, those alternatives requiring gravity diversion would result in a significant impact on lands under Williamson Act contracts[1] (refer to Section 3.2, Agricultural Resources), whereas this impact would not occur under the alternatives requiring a pumped diversion. The latter generally would result in greater demand for power, however, as discussed in Section 3.6, Energy Consumption.

These initial alternatives were subsequently refined, based on Stakeholder input, information about existing and proposed land uses in the Project area, special studies, geotechnical information, and budgetary considerations. Results of the preliminary geotechnical study indicated that construction would be more costly than originally anticipated due to soils that had low strength and were dispersive; would be subject to erosion from wave action; had the potential for compressibility, seepage, expansion, and liquefaction; and could not support conventional construction equipment.

Refinements included modifying the configuration of the New River alternatives involving pumped diversion of river water. The configuration originally included a narrow, roughly 2-mile-long pond on the far western side that was eliminated due to the relatively high cost of berm construction required in order to obtain a comparatively small amount of habitat. Additionally, eliminating this area avoided channels carrying natural drainage. The alternatives that included both New and Alamo river sites were eliminated because the costs to construct habitat in both areas would have greatly exceeded available funds; therefore, they were considered infeasible. Additionally, the portion of the alternatives that included Red Hill Bay was eliminated because the United States Fish and Wildlife Service (USFWS) has plans to develop shallow water habitat in this area as part of the Sonny Bono Salton Sea National Wildlife Refuge (NWR). (The USFWS also has a planned restoration project at the New River, and DWR and DFG are working in close coordination with NWR staff to avoid any conflicts between the two projects.) The refined alternatives being considered in the EIS/EIR are as follows:

- **Alternative 1 – New River, Gravity Diversion + Cascading Ponds[2]:** 3,130 acres of ponds constructed on either side of the New River (East New and West New), upstream gravity diversion of river water, and independent and cascading pond units.
- **Alternative 2 – New River, Pumped Diversion:** 2,670 acres of ponds constructed on either side of the New River (East New, West New, and Far West New), pumped river diversion at the SCH ponds, and independent ponds.
- **Alternative 3 – New River, Pumped Diversion + Cascading Ponds:** 3,770 acres of ponds constructed on either side of the New River (East New, West New, and Far West New), pumped diversion of river water, and independent ponds extended to include Far West New and cascading pond units.
- **Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond:** 2,290 acres of ponds constructed on the north side of the Alamo River (Morton Bay), gravity river diversion upstream of the SCH ponds, with independent ponds and a cascading pond unit.

[1] Commonly referred to as the Williamson Act, the California Land Conservation Act of 1965 (Government Code sections 51200–51297.4) enables local governments to enter into contracts with private landowners that restrict specific parcels of land to agricultural or related open space use. In return, these landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses rather than the property's full market value. Local governments receive an annual subvention of forgone property tax revenues from the State of California via the Open Space Subvention Act of 1971 (Government Code sections 16140–16154).

[2] All of the alternatives include independent ponds; thus, the name of the alternative reflects those ponds that also include cascading ponds.

- **Alternative 5 – Alamo River, Pumped Diversion:** 2,080 acres of ponds constructed on the north side of the Alamo River (Morton Bay and Wister Beach), pumped river diversion at the SCH ponds, and independent pond units.
- **Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds:** 2,940 acres of ponds constructed on the north side of the Alamo River (Morton Bay, Wister Beach), pumped river diversion at the SCH ponds with independent and cascading pond units.

The pond locations for each alternative, along with the general area where the upstream gravity diversion and conveyance facilities could be located, are shown on Figure 2-2.

The No Action Alternative also is considered in this analysis, as required by NEPA and CEQA. The No Action Alternative is described below, followed by a discussion of features that are common to each of the six Project alternatives and additional detail regarding each of these alternatives.

2.3 No Action Alternative

Under the No Action Alternative, the Corps would not issue a permit for the SCH Project, and no components of the SCH Project would be constructed. Other activities are expected to occur that would affect the Salton Sea ecosystem, however, as discussed below. The description of the No Action Alternative is based on the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (DWR and DFG 2007). The No Action Alternative is intended to reflect existing conditions (those present at the time the Notice of Preparation was issued) plus changes that are reasonably expected to occur in the foreseeable future if none of the alternatives are implemented, based on current plans and consistent with available infrastructure and community services.

2.3.1 Actions that Could Affect Inflows to the Salton Sea

Under the No Action Alternative, actions that could affect inflows to the Salton Sea include:

- IID Water Conservation and Transfer Project (and associated required mitigation measures);
- Colorado River Basin Salinity Control Program;
- Mexicali wastewater improvements;
- Mexicali power production;
- Total Maximum Daily Loads implementation;
- Coachella Valley Water Management Plan; and
- Other Quantification Settlement Agreement (QSA) related projects (refer to Section 1 for a discussion of the QSA).

Estimates of future inflows to the Salton Sea were developed in the Programmatic Environmental Impact Report (DWR and DFG 2007) and account for potential reductions in Colorado River water deliveries that would reduce agricultural return flows into the New and Alamo rivers, wastewater system improvements to the Mexicali II service area that would divert effluent to the Gulf of California, and recently constructed power plants that would use a portion of the New River flows for cooling water. The projected inflows from the Imperial Valley were also based upon historical patterns adjusted for QSA implementation and the IID Water Conservation and Transfer Project.

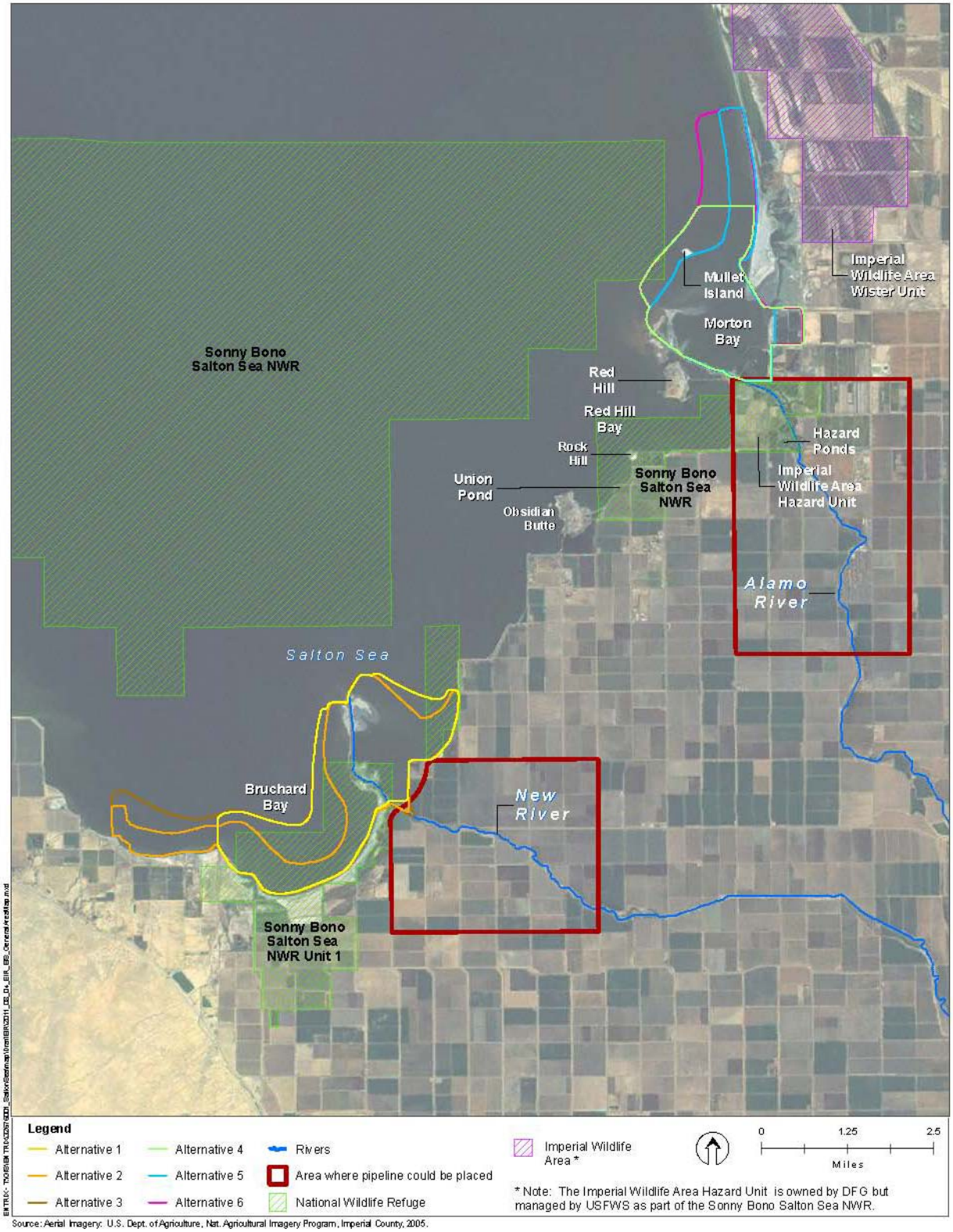

Figure 2-2 SCH Project Alternative Locations

Under the IID Water Conservation and Transfer Project, the amount of water to be conserved and transferred would increase over the first 24 years until 2026 when the transferred amount would be 303,000 acre-feet per year (afy). Mitigation water that is being put into the Sea by IID will minimize the effect of other actions on inflows through 2017. Historical inflows from the Coachella Valley also were adjusted for implementation of the QSA-related projects and the Coachella Valley Water Management Plan. Under the QSA, IID would conserve water and transfer the water to CVWD. This amount would increase to 103,000 afy by 2026. This amount of water would continue until 2047. After 2047, IID would provide 50,000 afy to CVWD, and the Metropolitan Water District of Southern California would provide 50,000 afy to CVWD.

Inflows to the Salton Sea would decline slowly until 2018 and decline more rapidly through the mid-2030s. Inflows would be relatively stable from the mid-2030s to 2078. These actions would result in an average inflow of over 900,000 afy until 2078. Changes in the inflows would result in changes in the Sea's surface water elevation, reducing it from approximately -231.87 feet mean sea level (msl) currently to -258.2 feet msl by 2077. Salinity would increase from 50,994 milligrams per liter (mg/L) currently to 278,000 mg/L by 2077. Air quality management facilities, described below, would not be implemented until the surface water elevation is below -235 feet msl and the soils are dry. Pupfish channels would not be constructed until the Sea's salinity exceeds 90,000 mg/L.

2.3.2 Facilities Included in No Action Alternative

QSA implementation and the related The IID Water Conservation and Transfer Project would require several actions affecting the Salton Sea, including air quality management on the playa that would be exposed due to QSA implementation, protection of desert pupfish at the Salton Sea to mitigate QSA impacts, and modification of recreational facilities at the Salton Sea to mitigate QSA impacts.

2.3.2.1 Air Quality Management

The IID Water Conservation and Transfer Project would result in the additional exposure of playa between -235 and -248 feet msl. To mitigate the potential air quality impacts from this area, the IID Water Conservation and Transfer Project Mitigation Monitoring and Reporting Plan included the following four-step air quality mitigation and monitoring plan:

- Restrict access to exposed playa;
- Conduct a research and monitoring program;
- Create or purchase offsetting emission reduction credits; and
- Direct emission reductions at the Salton Sea by implementing feasible dust mitigation measures or supplying water to the Sea to maintain moisture on the playa exposed by QSA actions.

Mitigation will only occur on the playa between -235 and -248 feet msl.

2.3.2.2 Air Quality Management by Other Landowners

As described above, the air quality management measures under the No Action Alternative would only be located between -235 and -248 feet msl. In accordance with the requirements of the local air quality management districts, landowners would be responsible for the remaining exposed playa between the existing shoreline and -235 feet msl. Although it is possible that air quality management for these areas also would require a water supply, no water has been allocated for lands above -235 feet msl. If water-based methods are used to control dusts on these lands, further reductions in the Salton Sea's surface elevations and more exposed playa below -248 feet msl would occur. Owners of these areas also would be

responsible for air quality management. The primary owners of lands in the seabed are the Federal government, IID, and the Torres Martinez Tribe.

2.3.2.3 Pupfish Connectivity

The IID Water Conservation and Transfer Project required that IID extend the drains in the Imperial and Coachella valleys into the Salton Sea as the water surface level recedes to increase available habitat for desert pupfish in the drains. This would occur after 2017 when IID is no longer required to provide mitigation water to the Salton Sea, as discussed in Section 1, Introduction. When conditions in the Sea become unsuitable for desert pupfish and preclude their movement among drains, pupfish channels would be constructed to interconnect the drains and eliminate the connection to the hypersaline Sea. The Sea is projected to become unsuitable for desert pupfish when salinity reaches about 90,000 mg/L. The pupfish channels would not be connected to the extended river or creek channels. Therefore, five separate desert pupfish areas would be developed. Along the Sea's southern shoreline, separate pupfish channels would be located north of the New River, between the New and Alamo rivers, and north of the Alamo River. Along the northern shoreline, separate pupfish channels would be constructed to the east and west of the Whitewater River.

2.3.2.4 Extension of Recreational Facilities

The IID Water Conservation and Transfer Project also required that IID extend boat ramps located around the shoreline and trails at Salton Sea State Recreation Area. These facilities are to be extended as the Sea recedes.

2.4 Features Common to the Project Alternatives Carried Forward for Detailed Analysis

All alternatives considered for the SCH Project would restore shallow water habitat lost due to the Salton Sea's ever-increasing hypersalinity and reduced area as the Sea recedes. The SCH ponds would use available land at elevations less than -228 feet msl (the former Sea level in June 2005). The SCH Project would consist of one or more large ponded units that each contains three to five smaller ponds (Figure 2-3). The newly created habitat would be contained within low berms. The water supply for the SCH ponds would be a combination of brackish river water and saline water from the Sea, blended to maintain an appropriate salinity range. The SCH Project is designed as a "proof-of-concept" project in which several project features, characteristics, and operations could be tested under an adaptive management framework. The proof-of-concept period would last for approximately 10 years after completion of construction (until 2025). By that time, managers would have had time to identify those management practices that best meet the Project goals. After the proof-of-concept period, the Project would be operated until the end of the 75-year period covered by the QSA (2078) or until funding were no longer available. The SCH ponds would be constructed and operated by DFG, on behalf of the California Natural Resources Agency.

2.4.1 Project Components

2.4.1.1 Basic Design Considerations

The SCH ponds would be constructed primarily on recently exposed playa following the existing topography (ground surface contours) where possible. The ground surface within the SCH ponds would be excavated (with a balance between cut and fill) to acquire material to build the berms and habitat islands. The ponds would use a range of design specifications. Specifically, the SCH water depth at the exterior berms would range between 0 and 6 feet (measured from the water surface to the Sea side toe of the berm); the maximum depth within the SCH ponds would be up to 12 feet in excavated holes; and the maximum water surface elevation would be at -228 feet msl.

2.4.1.2 Pond Unit Type

Each pond unit could be either independent or cascading (Figure 2-3). An independent pond unit would have one inflow point for brackish and saline water that could be subdivided into multiple smaller ponds. Water would be conveyed between the smaller ponds through a gated pipe, and the ponds would have similar water surface elevations. A cascading pond unit would be attached to an independent pond unit on the outboard (Sea) side and would receive water from an independent unit. In this case, the water surface in each pond would differ by about 2 to 4 feet for Alternatives 1 and 3. For Alternatives 4 and 6, the difference would be about 5 feet. Cascading would be used to help aerate the water in the lower pond unit (Figure 2-3).

2.4.1.3 Berms

Berms would be constructed to impound water to create and subdivide ponds. Up to four berm types would be constructed as part of the Project alternatives:

- **Exterior berm** – Exterior berms would define the outer boundary of an SCH pond unit (either cascading or independent). These berms would separate the Sea from the SCH ponds and the SCH ponds from the interception ditch and adjacent land uses above -228 feet.
- **Interior berm** – Interior berms would subdivide the SCH pond unit into individual smaller ponds.
- **Cascading berm** – Cascading berms would separate a cascading pond from an independent pond and would contain facilities to cascade the water from one pond to another (applicable only to Alternatives 1, 3, 4, and 6).
- **Improved river berm** – The improved river berm would be an elevated berm on top of the existing ground along the river.

The berms would be placed to achieve the desired pond size, shape, bottom configuration, and orientation. The exterior berm would be placed with the downstream (Sea side) toe of the berm at an elevation of -234 feet msl for independent ponds and at a lower elevation for cascading ponds. In both cases, the berms would be located so that under the maximum pond water elevation, the difference between the water surface elevation in the pond and the downstream toe of the berm would be 6 feet or less. The exterior berm would be protected with riprap or other materials on the outboard (Sea) side. Interior berms would have riprap or other bank protection on the berm slopes above and below the high water line.

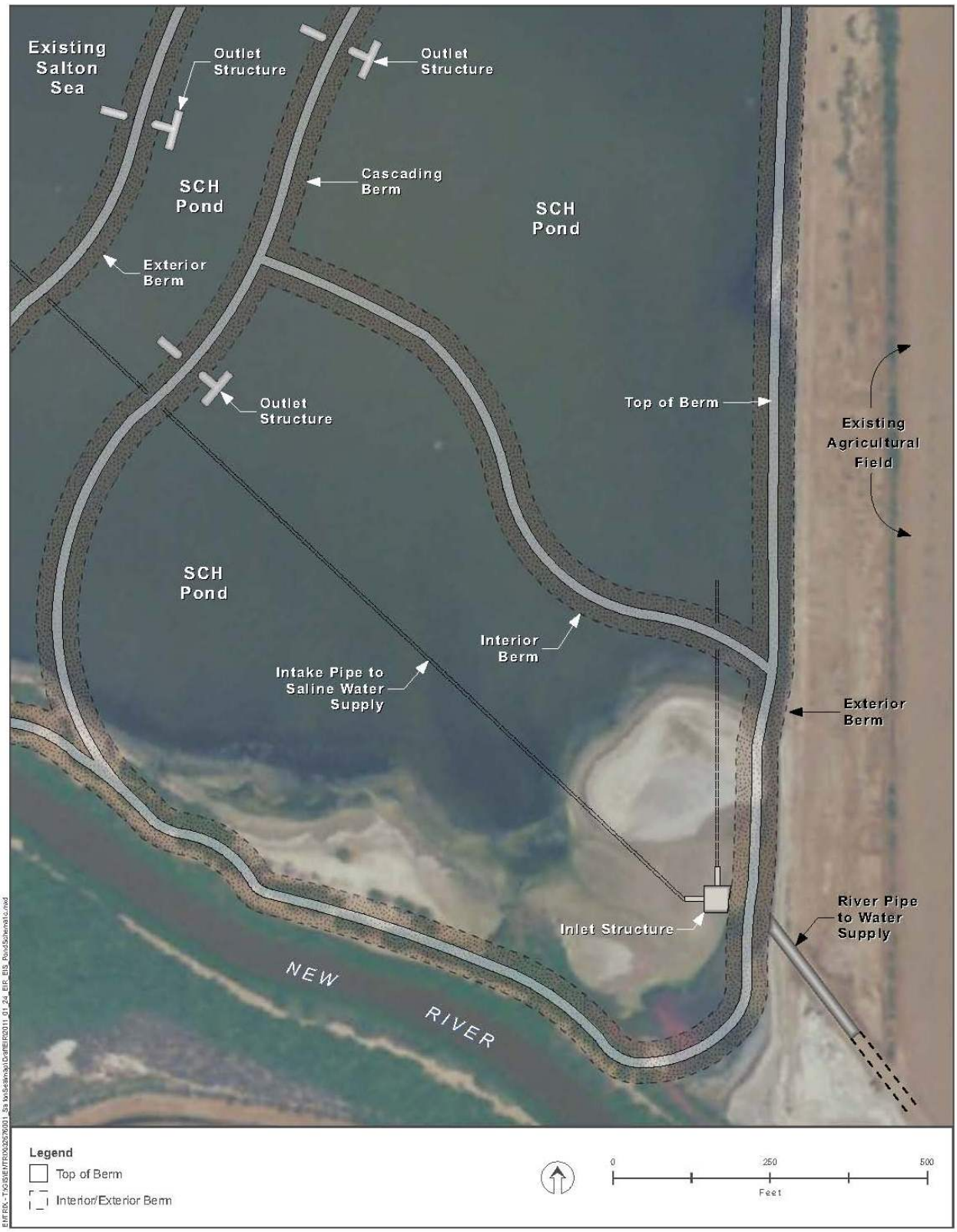

Figure 2-3 Conceptual Plan of Cascading and Individual SCH Pond Units

Berms would be constructed by two methods. “In the dry” construction activities would occur in exposed playa areas where the berm would be located at an elevation higher than the Salton Sea’s elevation at the time of construction. In the near term however, the exterior berm, especially with a cascading pond unit, would be in direct contact with the Sea. “In the wet” construction may require a barge-mounted dredge to excavate the material for the berm. The berm side slopes were determined based on Project-specific geotechnical analyses (refer to Appendix C, Geotechnical Investigations). Figure 2-4 shows a typical cross section of a berm and an outlet structure. A berm would include a single-lane, light-duty vehicle access road on top and turn-outs every 0.5 mile. Based on preliminary geotechnical analyses the foundation after berm placement would consolidate, thus requiring an approximately 10.5-foot high berm to be built to yield an 8-foot berm.

Construction “in the wet” would result in wave action against the seaward toe of the berms during both construction and the following period while the level of the Sea was above the toe of the berm. Protective measures would be implemented in order to prevent wave action from eroding the berm fill. Several construction techniques could be used, all of which involve the placement of a barrier on the Sea side of the construction area to intercept the wave action. The techniques would be examined during the final Project design; those under consideration include the following:

- **Sacrificial soil barrier** – This barrier would consist of soil excavated onsite and placed to create an extra-wide buttress to the berm. It would be constructed as a low-level shelf or a shoal on the Sea side of the berm. A portion of the shelf width may be eroded by waves on windy days. The shelf width would be sized to minimize the risk of erosion extending back to the main section of the berm. The sacrificial portion of the berm may require replenishment or supplemental facing until a more resistant facing was installed or the level of the Sea recedes.
- **Rubble rock mound** – This is the most traditional form of breakwater, consisting of placing uniform-sized quarried stone in a trapezoidal section. Other durable materials may be used for the rubble pieces, including broken concrete. The rubble would be placed on a geotextile.
- **Sheet pile barrier** – This type of barrier involves driving sheet pile ahead of the berm construction to block the wave action. The sheetpiles may need to be driven into the stiff alluvium beneath the Sea sediments to develop the needed lateral support.
- **Timber breakwater** – This type of breakwater consists of wood plank facing bolted to horizontal timbers (walers) spanning vertical piles. Piles may be spaced from 8 to 12 feet. The vertical piles could be timber, steel, or prestressed concrete.
- **Geotube** – A Geotube is an oval (in cross section) geotextile tube with closed ends that is hydraulically filled with soil. The Geotube would be placed at the seaward toe of the berm fill, creating a wave barrier. Once installed and filled, sediment fill for the berm would be placed directly against the Geotube. The Geotube would be permanently left in place. The geotextile material would be selected with sufficient resistance to ultraviolet radiation to maintain the Geotube’s integrity until the level of the Sea receded below the toe of the fill. During filling, finer grained suspended-sediments would flow through the pervious geotextile, creating a temporary turbid water condition. With the high clay fraction in the sediments, the viability of using Geotubes may need to be verified by a demonstration test.
- **Large sand bags** – Bags that can hold up to 1 to 1.5 tons of sand may be placed in a line to create an erosion- resistant barrier that would be left in place. These bags would function similar to the Geotube, creating a soil-filled, geotextile-faced gravity structure to resist wave action.

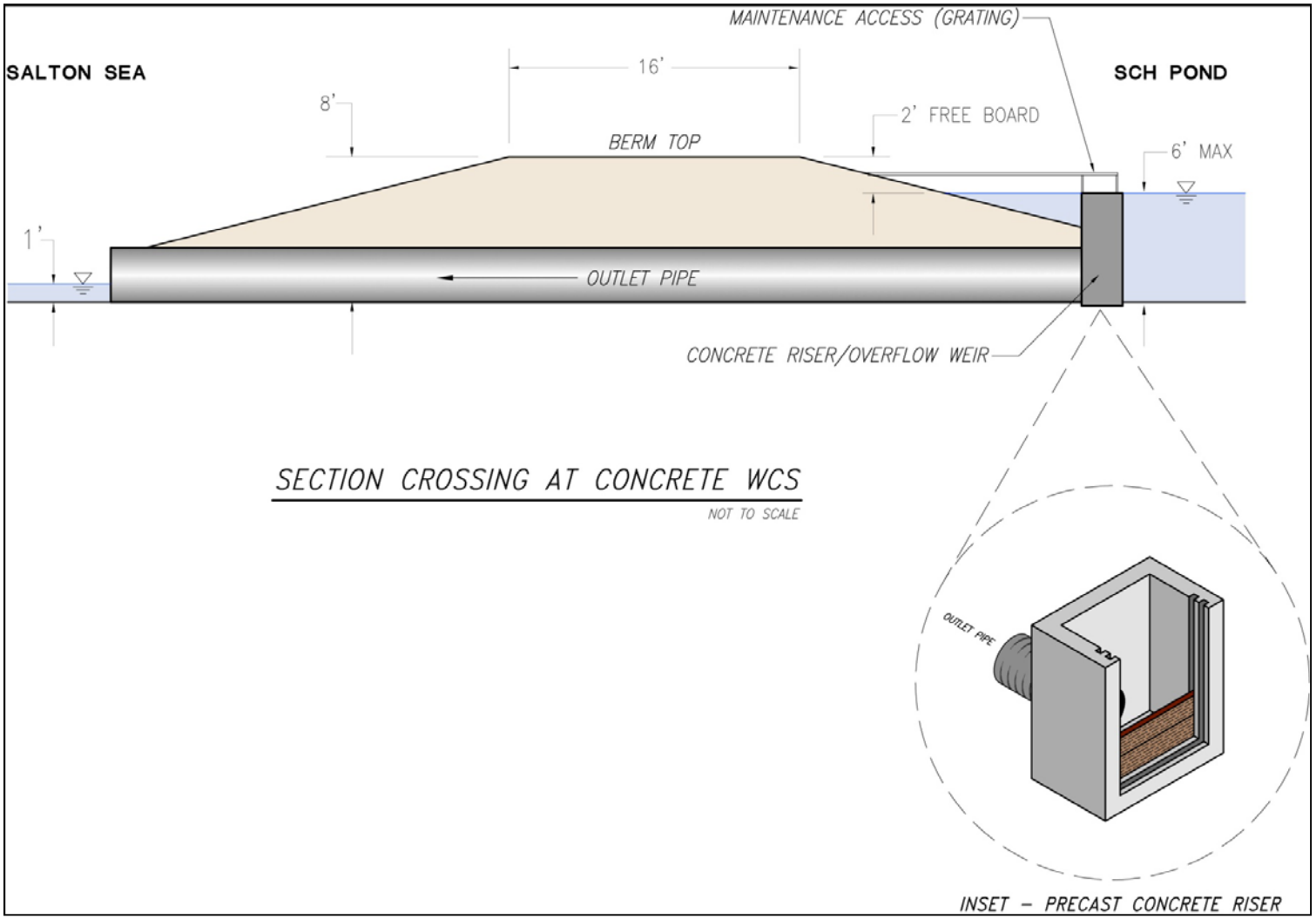

Figure 2-4 Conceptual Cross-Section of Pond Berm and Outlet Structure

- **Water-filled bladder** – A water-filled bladder is a rubber tube that would be placed seaward of the berm fill to create a calm water condition on the pond side of the bladder. The bladder would accept the wave action while the berm was being constructed. This structure would be temporary and would be removed after the berm was stabilized and supplemental erosion protection, such as riprap, was added on the seaward face.
- **Floating tire breakwater** – A floating tire breakwater could be used to absorb wave energy seaward of the planned berm alignment. The tires would be lashed or chained together, creating a wide floating structure. One common configuration is known as the Goodyear floating tire breakwater. The breakwater would be sited so that the tires did not touch the seafloor. As the Sea recedes, the breakwater may need to be positioned to keep the tires off the bottom. Once it was no longer needed at a given location, the breakwater could be moved to another site in need of protection.

2.4.1.4 Boat Ramps

Boat ramps would be needed in the ponds to allow boat access for monitoring and maintaining the ponds, Project features, and habitat conditions.. An airboat similar to the DFG or USFWS boats currently used on the Sea would be used in the SCH ponds. A boat launch would accommodate a vehicle and trailer of approximately 46 feet in length with appropriate room for turn-around before the ramp. The ramp would extend about 30 feet into the water and require a 3-foot depth at the end of the ramp. Precast concrete barriers would be used on the windward side of the ramp to protect the boat during launch and recovery.

2.4.1.5 Borrow Excavations

On-site borrow material would be needed to construct the berms and habitat features such as islands. The amount of excavated material would be balanced with the amount of fill needed for constructing the berms and other features, thus eliminating the need for importing embankment material, with the exception of imported riprap and gravel. The ultimate source of borrow material within the Project footprint would be determined by berm construction methods, geotechnical properties of the playa material, and habitat requirements. The borrow areas generally would be adjacent channels, swale channels, and shallow excavations. Swales and channels would be excavated within the ponds with scrapers and excavators to a depth of 2 feet or more. They would ultimately serve as habitat features that connect shallow and deep areas of a pond. Shallow borrow areas would be taken from the highest and driest ground and would provide approximately 2-foot-deep water depths in areas that would otherwise have very shallow water less than 1 foot.

2.4.1.6 Depth Contouring

The channels excavated for borrow material to construct berms and islands would create habitat diversity. In addition, features such as swales would be used to achieve greater diversity of depths and underwater habitat connectivity. Borrow channel flowline elevations may not be low enough if the material were too saturated or unsuitable for embankment. There may also be areas within the pond units in which the native material was unsuitable for borrow, yet a channel was still desired to provide a connection to other deeper water habitat areas. In these cases, a hydraulic dredge would be used to provide greater depth to borrow channels or create new channels through areas with soft soils. Soils removed as dredge spoils would be placed either within the Project footprint or outside of the exterior berm in the Sea.

2.4.1.7 Water Supply

The water supply for the Project would come from the brackish New or Alamo rivers, depending on the alternative, and the Salton Sea. The salinity of the river water is currently about 2 parts per thousand (ppt), and water in the Sea is currently about 51 ppt. For reference, the ocean is about 35 ppt. Blending the river water and seawater in different amounts would allow for a range of salinities to be used in the ponds.

Detailed modeling studies performed for this Project showed that increasing salinity through evapoconcentration (allowing the salinity to increase by evaporating the fresh water and leaving the salts behind) would not produce higher salinity ponds in a reasonable time frame. The saline diversion would occur from pumps placed on a structure in or adjacent to the Sea. The river diversion would occur either by a gravity diversion from an upstream location or pumps located near the SCH ponds.

2.4.1.8 Inflow and Outflow Structures

The water supply would be brought into the ponds through an inflow structure. This structure would be connected to a pumped or gravity flow system for the river and a pumped system for the saline water. A single inflow structure would be used to distribute the water to individual ponds within a unit. The brackish water and saline water inflows could be either separate systems delivering water to a pond or combined to premix the different salinity water.

Outflow structures would be included in all SCH ponds. The outflow structure would consist of a concrete riser with removable flash boards and an outlet pipe. The flash boards could be removed to adjust the water surface elevation of a pond or to reduce the water level elevation in an emergency. The top of the structure would be a weir that would maintain the maximum water surface at the -228 feet msl elevation (6 feet deep at the outlet). The structure and the outflow pipe would be sized to handle normal pond flow-through and also the overflow during a 100-year rainfall on the pond. Because the ponds would not have an uncontrolled connection to the river, the outflow structure would not have to handle flood flows entering from the river. The top of these structures, which would act as an overflow weir, would be at least 2 feet below the top of the berms.

2.4.1.9 Water Control Structures

Water control structures would allow for the controlled supply and conveyance of water through the pond units. These structures would be managed to adjust the rate of flow and maintain desired water surface elevations in individual ponds. Structures could be placed to allow water to flow between ponds units in which an independent supply is not cost effective, or to provide flexibility in the management of water resources supplied to the ponds.

2.4.1.10 River Diversion Gravity Diversion Structure

For alternatives that consider supplying river water to the Project via gravity diversion (Alternatives 1 and 4), a water control structure would be constructed at the diversion location along the bank of the New or Alamo rivers. The structure would be a series of pipes to extract water laterally from the river, and discharge it into an adjacent sedimentation basin. From the sedimentation basin, the water would be delivered by gravity to the SCH ponds through large-diameter brackish water pipelines. The diversion would be located, at a minimum, a distance upstream that would have a sufficient water surface elevation at the river to run water through the diversion pipes, through the sedimentation basin, down the brackish water pipeline, and into the SCH ponds.

2.4.1.11 Brackish Water Pipeline

The gravity brackish water pipeline that would convey water from the sedimentation basin to the SCH ponds would consist of several large-diameter polyvinyl chloride (PVC) pipes that would be buried along the route. The final configuration of the brackish water pipeline would depend on topographic information, available right-of-way, and cost. The brackish water pipeline could travel either along the river or along public roads. The exact route that would be followed is not identified at this time because it would be dependent on the availability of land from willing owners and the ability to negotiate a lease or easement from such owners. The area in which the brackish water pipeline and associated diversion

facilities could be located is shown on Figure 2-2. It is estimated that three 5-foot-diameter pipes would be needed to minimize the velocity in the brackish water pipeline (thereby minimizing head loss).

2.4.1.12 River Diversion Pump Stations

A pump station would be required for alternatives using a river water diversion located at the Project site (Alternatives 2, 3, 5, and 6). A pump station would be required because the water surface elevation in the river at the Project sites is below the design elevation of -228 feet msl for the SCH ponds. A single pump station could deliver water to the SCH ponds on both sides of the river. Water would be pumped directly into sedimentation basins located on either side of the river. The pump station would be composed of multiple pumps, which would allow for the diversion rate to vary by operating a different number of pumps. In addition, the use of multiple pumps would allow some pumps to be taken out of service for maintenance without eliminating the entire diversion. The power to operate the pumping station would be supplied from existing three-phase power lines owned by IID.

2.4.1.13 Saline Water Supply Pump Station

Supplying saline water to the SCH ponds to achieve the desired salinity would require pumping from the Salton Sea, which has a lower water surface than that of the SCH pond units. The pump station could be located on a platform in the Sea, which would require existing three-phase power to be brought out to the station. Pumps in a saline environment would have a limited life span because of the salinity. The pump station may have to be relocated farther out as the Sea recedes and as pumps need to be replaced for maintenance. Another option would be to excavate a channel to bring the seawater to a pump station located closer to the Project site. This option would require less supply pipeline and a shorter run of utility lines, but would require that the channel be maintained and deepened as the Sea recedes. It is important to note that as the Sea recedes, it gets progressively saltier. At some point in time seawater may not need to be used because of its hypersaline condition, and salinity may be achieved through a tailwater return system or similar process.

2.4.1.14 Tailwater Return Pump

A pump located at the far end of a SCH pond, or series of SCH ponds, could be utilized to return water that would otherwise be discharged to the Sea back to the top of the system. This method is for promoting the movement and flow of water through the SCH ponds while conserving water resources. It also could serve to aerate the water.

2.4.1.15 Power Supply

Electrical power would be needed to operate the pumps. Existing aboveground power lines operated by IID would be extended to reach the pumping plant located at the SCH ponds or in the Salton Sea; a three-phase, 480-volt aboveground system would be required at the SCH ponds while a three-phase, 480-volt underwater conduit system would be required to reach the pumping plant located in the Salton Sea. At the New River, the supply would be extended 1 mile for the river pumps and 1 mile for the Sea pumps. At the Alamo River, the supply would be extended 1.5 miles for the river pumps and 1 mile for the Sea pumps (Figure 2-5). Aboveground electrical power lines extended as a result of the SCH Project would be modified to prevent bird collisions and electrocutions (e.g., bird deterrents).

2.4.1.16 Sedimentation Basin

A sedimentation basin would be needed for all alternatives to remove the suspended sediment from the influent river water before it entered the SCH ponds. For alternatives considering a gravity diversion, the sedimentation basin would be located adjacent to the river upstream of the SCH ponds at the point of diversion, with water delivered to the SCH ponds with a brackish water pipeline from the sedimentation basin. For pumped diversion alternatives, sedimentation basins would be located at the SCH ponds on each side of the river and would feed water directly into the ponds.

Figure 2-5 Location of IID's Three-Phase Power Lines and Potential Project Extensions

A preliminary investigation of each river, upstream of the Project sites, discovered that the surrounding terrain elevation is up to 15 feet higher than the river water surface. The sedimentation basin and brackish water pipeline would need to be excavated down below the ground surface to below the river water surface elevation to allow water to flow toward the SCH ponds, which could be in excess of 20 feet of excavation. The basin is estimated to be between 10 and 30 acres with a 40 to 120 acre-foot capacity, depending on the alternative. The basin would have steep side slopes (2:1) to discourage establishment of emergent vegetation.

The sedimentation basin would detain the diverted water for about 1 day to allow the suspended sediment to settle out of the water column. The material would settle to the bottom of the basin where it would accumulate over time. The basin would be divided into two parts: the active basin and the maintenance basin. The maintenance basin would be dried and the sediment removed. This basin would then become the active basin and the other side would be dried. The excavated material would be used in the SCH ponds to maintain berms, construct new habitat features, or stockpile for eventual use at the SCH Project.

2.4.1.17 Interception Ditch/Local Drainage

Existing drainage ditches located along the Salton Sea's perimeter discharge agricultural drainwater to the Sea. To keep the drainwater out of the SCH ponds, an interception ditch would be constructed that collects the drainwater and routes the water around the Project. The interception ditch would be excavated along the existing shoreline to intercept any water discharging from the land side, and drain it around the SCH ponds to the Sea. A berm would be constructed on the SCH pond side of the interception ditch to serve as the containment structure. The interception ditch would also serve other important functions. Because the design water surface for the SCH ponds may be at a higher elevation than the agricultural drains, it would prevent the Project from causing water to back up in the these drains, which would prevent the discharge of drainwater. Another important function is to mitigate the potential of the higher water in the ponds to create a localized shallow groundwater table that would be higher than that which currently exists on neighboring properties. The interception ditch would cause a break in the hydraulic movement of water through shallow soils and carry it away as drainwater to the Sea. Finally, this feature would maintain connectivity among pupfish populations in drains adjacent to the Project (allow fish movement along the shoreline between drains), which is a requirement of IID's Water Conservation and Transfer Project.

SCH berms would be located in a way that would allow natural runoff to proceed to the Sea unobstructed.

2.4.1.18 Aeration Drop Structures

For cascading ponds, small-diameter pipes could be placed in the cascading berm to allow flow from the upper pond to enter the lower pond. Because of the elevation difference (2 to 5 feet, depending on the alternative), the water would spill from the pipe, creating a localized zone of increased dissolved oxygen. The pipes would be placed near the top of the water column of the upstream pond, allowing the surface water to discharge to the lower pond. In the process of discharging the water out of the pipe, it would be agitated as it fell to the lower water surface elevation to increase dissolved oxygen. The structures could be grouped or placed at some interval along the intermediate berm.

2.4.1.19 Bird Habitat Features

Islands for roosting and nesting would provide habitat for birds that is relatively protected from land-based predators. Each pond would include several islands: one to three nesting islands (suitable for tern species) and three to six smaller roosting islands (suitable for cormorants and pelicans). The islands would be constructed by excavating and mounding up existing playa sediments to create a low profile embankment approximately 1 to 4 feet above waterline. The nesting islands (0.3 to 1.0 acre) would have an elliptical and undulating shape with sides that gradually slope to the water (8 to 9 percent slope). The roosting islands would be V-shaped or linear, approximately 15 feet wide and 200 feet long, with steep sides to prevent nesting. Orientation of most or all roosting islands would be along prevailing wind fetch, but it could be varied for a subset of islands if deemed necessary to test habitat preference and island performance (i.e., erosion susceptibility) for future restoration implementation.

The overall pond unit could also include one or two very large nesting islands from 2 to 10 acres, with rocky substrate for double-crested cormorants and gulls. The islands would be constructed by mounding up sediments to create a tall profile (up to 10 feet), and armoring with riprap to create rocky terraces. However, the amount of fill required to construct such an island is large and may be cost prohibitive. If this option proves infeasible these features would be eliminated from the final project design.

The number and placement of islands would be determined by the pond size, shape, and depth. Islands would be placed at least 900 feet from shore and in at least 2.5-feet-deep water to discourage access by land-based predators such as coyotes and raccoons.

An alternative island habitat technique could be constructing islands that would float on the pond's surface rather than be conventional excavation and placement of playa sediment. In addition to islands, snags or other vertical structures (5 to 15 per pond) could be installed in the ponds to provide roosting or nesting sites. They could be dead branches or artificial branching structures mounted on power poles. They would be optional features for a SCH pond, depending on presence of existing snags and roosts, availability of materials, and cost feasibility.

2.4.1.20 Fish Habitat Features

The SCH ponds would provide suitable water quality and physical conditions to support a productive aquatic community including fish. The Project would incorporate habitat features to increase microhabitat diversity and provide cover and attachment sites (e.g., for barnacles). The type and placement of such features would depend on habitat needs of different species, site conditions, and feasibility, and would be varied to test performance of different techniques as part of the proof-of-concept approach. Examples of habitat features being considered for potential inclusion follow:

- **Swales or channels** – These features would be excavated through the middle of ponds to the exterior berm approximately 2 to 4 feet below the surface of the pond bottom and approximately 20 to 150 feet wide. The channels would be sloped toward the exterior berm to be self draining if a pond's water level was lowered or the pond was emptied for emergency purposes. The width of the swales may be larger depending on the soil conditions and the need to prevent sloughing of soil into the channel during pond operation. The swales or channels would create variable depths to enhance habitat diversity and would provide connectivity along a depth gradient from shallower habitat to deeper areas toward the Salton Sea. Swales would be created along the sides of the pond as a result of excavation and construction of berms.
- **Hard substrate on berms** – Berms would be armored with riprap to protect the toe, spanning approximately a 1- to 2-foot depth at the waterline. This rocky substrate would also provide diverse microhabitat amid the interstitial spaces and hard attachment points for algae or invertebrates.

- **Bottom hard substrate** – The Project could include some patches of submerged hard substrate in certain ponds to increase the amount of cover and attachment sites for sessile or benthic organisms (e.g., benthic macroinvertebrates, algae) that support food for fish.
- **Floating islands** – Another feature being considered for possible inclusion would be floating islands to provide cover for fish from bird predators and possible attachment sites for sessile organisms. Experimental concepts to be evaluated would include size, number, and seasonal placement of islands within the ponds.

2.4.1.21 Operational Facilities

A trailer or other temporary structure would be located near the ponds and would provide office space for permanent employees. Bottled water would be brought in for potable uses, and power would be provided to the facility. A self-contained waste system would be used; no septic tanks or sewerage would be required. Boats and other equipment would be stored at Imperial Wildlife Area's Wister Unit in existing facilities.

2.4.1.22 Fish Rearing

A goal of the SCH Project is to raise fish to support piscivorous birds. To accomplish this goal, a supply of fish that can tolerate saline conditions must be available for initial stocking of the SCH ponds and possible restocking if severe fish die-offs occur. The SCH ponds would be stocked initially with fish species currently in the Salton Sea Basin, such as California Mozambique hybrid tilapia and other tilapia strains in local waters. If necessary to obtain sufficient numbers for stocking, fish may be collected from local sources, and then bred and raised at one or more of the private, licensed aquaculture facilities in the area (within 15 miles of all alternative sites).

2.4.1.23 Land Acquisition

The land where the SCH ponds would be located is owned by IID and would be leased from IID for the Project's duration, with the exception of the land at the Wister Beach SCH pond, which is owned by a number of private parties. Much of the land where the ponds would be located is already leased by IID to the USFWS for the management of the Sonny Bono Salton Sea NWR. An agreement between DFG and USFWS would be established prior to construction of the SCH Project in order to ensure compatibility between NWR uses and the SCH Project. Other Project facilities, such as pump stations, pipelines, or access roads may be located on IID land, public right-of-way, or private land. Access roads would be needed for construction vehicles to move from the public right-of-way to the construction site. In the case of private land, easements would be obtained from willing landowners only. If an easement cannot be negotiated with a landowner, the proposed facilities would be located at another site. The easement would be structured so as to not preclude the continued use of the property by the landowner. The land in the easement would be disturbed during construction but then would be returned to the preexisting condition after construction, except at the sites of permanent facilities, such as pump stations, diversion works, and pipeline access manholes.

2.4.1.24 Public Access

The SCH Project is not specifically designed to accommodate recreation because the provision of recreational opportunities is not a Project goal. Nevertheless, some recreational activities would be available to the extent they would be compatible with the management of the SCH ponds as habitat for piscivorous (fish-eating) birds dependent on the Salton Sea and nearby sensitive resources. Such activities would include day use, hiking, bird-watching, and non-motorized watercraft use. However, management plans may require that certain areas be seasonally closed to human activities to avoid disturbance of sensitive birds. When bird nesting is observed by SCH managers, human approach would be limited by

posted signs. Hours of public access would be restricted to early morning during hot weather when nesting birds could be present. Fish would not be intentionally stocked for the purpose of providing angling opportunities. Nevertheless, such opportunities may be provided at the SCH ponds, in particular for tilapia. Fish populations would be monitored as a metric of the SCH Project's success. If populations became well established and appeared to provide fish in excess of what birds were consuming, angling would be allowed. Waterfowl hunting may be allowed, consistent with the protection of other avian resources.

2.4.1.25 Project Compatibility with other Potential Future Land Uses

The SCH Project would be designed and operated to be compatible with other projects in the area.

Geothermal Development

The proposed SCH pond sites are located in an area that has the potential to be developed with geothermal uses (subject to the appropriate environmental compliance and approval processes), including one 10-acre well pad in each quarter section in unspecified locations within the SCH Project's boundaries, pipelines to convey geothermal water, roads that can support heavy loads, and electric transmission lines. Geothermal pipelines, roads, and electric transmission lines may require easements up to 600 feet wide for construction, access, and maintenance. Geothermal power generation plants typically require sites up to 50 acres. At this time, it is not known whether such facilities would be constructed and where they would be located. Their siting, construction, and operation would require permits and independent environmental analysis.

Geothermal development companies were consulted while the SCH Project alternatives were being developed, and the SCH Project is based on information that is currently available regarding their requirements, and how the SCH ponds and berms could be adapted, as needed, to accommodate future geothermal facilities such as well pads and access roads. Although this accommodation could incrementally reduce the amount of habitat restored as part of the SCH Project, this loss would not affect the overall viability of the SCH Project and the benefits it provides. Modifications to the SCH Project to accommodate this potential future development would be the responsibility of the geothermal developers and the impacts of such development are outside the scope of this EIS/EIR. As such, geothermal development in the Project area, should it occur, would be completely separate and distinct from the SCH Project and would be subject to its own environmental review and permitting processes. Such development is not the subject of this EIS/EIR, and impacts of geothermal development are not addressed herein.

Sonny Bono Salton Sea NWR Habitat Restoration Projects

The USFWS has indicated interest in developing approximately 700 acres of shallow water habitat in Red Hill Bay in an effort to maintain recent historic wetland values on this part of the NWR. As discussed above, this site was originally considered as a location for the SCH Project, but this area was removed from the SCH Project alternatives based on the USFWS' plans for the area. The USFWS is also planning to develop a restoration project at Bruchard Bay. This area is adjacent to, but outside of, the area proposed for the SCH Project. The Unit 1 A/B Ponds Reclamation Project is planned for a separate portion of the NWR at the southern tip of the Salton Sea. This area is within the current footprint of the proposed SCH alternatives at the New River. The SCH agencies would coordinate with the USFWS to maximize the constructability of both projects; however, the USFWS considers the SCH Project a priority in this area and if reclamation of part or all of the old Unit 1 A/B Ponds is not possible as a result of the SCH Project, the USFWS prefers to seek reclamation alternatives elsewhere (personal communication, C. Schoneman 2011).

2.4.2 Construction

SCH Project construction would be extensive, involving earthwork, concrete placement, electrical, and structural processes. The general construction activities are summarized below. The Project would be constructed over a 2-year period beginning in late 2012. Most construction would take place during the daytime, but dredging could take place 24 hours a day.

2.4.2.1 Pond Construction Techniques

Construction activities would occur in both wet and dry areas of the proposed pond sites. The dry areas (exposed playa) would be those areas between the Sea's elevation at the time of construction (estimated to be about -233.9 feet msl) and the -228-foot contour. This construction would be accomplished with land-based equipment. The wet areas would be those portions of the Sea that were inundated at the time of construction. Construction in these areas would be accomplished with floating equipment. Transition areas may start dry but become wet during construction. These areas would become wet because Project-related excavation may expose shallow groundwater or because of the presence of soft soils. The soft soil areas may appear dry but typically have water less than 2 feet below the surface and the soils lack the structural capability to support construction equipment. In these areas, low-ground pressure vehicles, construction mats, or constructing temporary elevated roadbeds could be used to move equipment through these areas.

Excavation equipment and techniques would vary depending on soil and water conditions at the time and location of the activity. Excavation activities would produce channels that allow for easier water-borne excavation, swales in the newly constructed habitat that would not be adjacent to berms, and widespread shallow borrow areas. Barge-mounted equipment would be used to construct borrow channels and berms in areas that would be flooded at the time of construction. The barge would operate from the channel it was constructing while excavating and piling material for a berm. Swales would be constructed with scrapers and excavators, and achieve 2- to 4-foot or potentially deeper water depths. These would ultimately serve as habitat features that connect shallow and deep areas of a pond. Shallow borrow areas would be taken from the highest and driest ground, and would provide approximately 2-foot-deep water depths in areas that would otherwise have very shallow water (less than 1 foot deep). Scrapers or excavators would be used to accomplish this recontouring.

2.4.2.2 Land-Based Equipment

The equipment used to construct in the dry would include scrapers, bulldozers, excavators, front loaders, and dump trucks. Scrapers are effective in excavating soil and moving it to a placement site, while bulldozers, excavators, and front loaders are useful in excavating and piling the soil in the same area. Excavators and front loaders could be paired with a dump truck to move the excavated material to a different location. The objective of the dry construction would be to minimize the distance that excavated material is moved. The land-based equipment would be used for earthmoving activities such as shaping the ponds, constructing the berms, and constructing the habitat features. An additional piece of land-based equipment that could be used is a pile driver to place piles for the inlet and outlet works. The land-based equipment would use, if needed, equipment with low-ground pressure tires.

2.4.2.3 Floating Equipment

Floating equipment would be used in the inundated areas and would consist of a barge-mounted excavator or clamshell dredge. The dredge would require a water depth of between 5 and 10 feet deep to operate, depending on the size of the barge. However, a clamshell dredge could also work from the channel it excavated. Floating equipment would be used to construct the exterior berms of the ponds.

2.4.2.4 Construction Staging Areas

A central construction staging area would be used to store construction equipment and supplies. The staging area would be located adjacent to the SCH ponds at about the -228-foot contour. The area would be about 2 acres and would be designed to avoid any off-site movement of spilled fluids or stormwater. After construction, the staging area would be restored to the condition prior to construction or incorporated into the Project. Additional staging areas located outside the public right-of-way would be established near the upstream diversion under Alternatives 1 and 4 through easements with the landowner.

2.4.2.5 Inlet and Outlet Works

Facilities such as outlet and inlet works located in the pond area would be constructed with land-based equipment. Equipment such as front loaders could be used to move precast structures to the site and an excavator or small crane rig could be used to place piles to support the structures. These piles would be driven into the playa until solid material (typically the clay layers that are present) is encountered. Depending on the timing of the installation of these structures relative to berm placement, the outlet works may be constructed from the top of the berm.

2.4.2.6 Pumping Plants

The pumping plant for the river diversion would be constructed using land-based equipment kept at the main staging area. The equipment would include excavators to excavate the diversion bay and a small crane rig to place sheet pile to separate the construction area from the river. Temporary pumps would be used to dry out the inlet to the river diversion. The pumped water would be stored in a temporary basin to settle the suspended material and then returned to the river downstream of the excavation.

The saline pumping station would be constructed from a floating barge. Equipment on the barge would drive piles into the seabed to support the pumping facility. Temporary framework would be placed to allow for a concrete deck to be poured above the current Sea elevation. The pipeline to convey the saline water to the SCH would be placed in a trench on the seabed or on piles, depending on the soil conditions. The electrical wiring for the power supply would be placed in conduit alongside the pipeline. The design may also include a 4-inch brackish water pipeline that would convey river water out to the pumping plant as a non-saline water supply for maintenance flushing of the saline water pumps. The seawater pump station would be above the Sea elevation and accessed by boat. The facility may include deterrents to prevent birds from roosting or nesting on the structure.

Alternatively, the saline pumping station may be constructed at the outer perimeter of the SCH ponds. Construction would involve similar methods as those for the river diversion pump station and would occur from the completed berm top.

2.4.2.7 Gravity Diversion

The gravity diversion from the river would take place several miles upstream of the SCH ponds and would operate from a secondary staging area. The equipment would include excavators to excavate the diversion bay and a small crane rig to place sheet pile to separate the construction area from the river. Additional excavation would be needed for the brackish water pipeline corridor and the sedimentation basin.

2.4.2.8 Brackish Water Pipeline Construction

Excavation of the sedimentation basin and brackish water pipeline corridor would occur with excavators, bulldozers, scrapers and dump trucks. The sides of the trench could be laid back to avoid side wall

collapse but this design specification would require additional excavation and right-of-way. As an alternative, the trench could be shored to minimize the construction area. Brackish water pipeline testing would be conducted prior to its operation. The brackish water pipeline would be cleaned, filled with river water, and checked for leakage. The water would be discharged into the SCH ponds or sedimentation basin once the test was completed.

2.4.2.9 Power Line Construction

Three-phase power would be required to operate the river or saline pumps. In both instances, power would have to be extended from 1 to 2 miles from the current locations to supply the pumps (Figure 2-5). Extension of the power lines would occur using aboveground power lines and require the placement of power poles. The extension would be similar to what is currently found in the area. The required equipment includes an auger, small crane, and a power line machine. Provision of the power and connecting into the existing system would require coordination with IID. Power lines for the saline pumps would be provided in underwater conduit. Aboveground electrical power lines extended as a result of the SCH Project would be modified to prevent bird collisions and electrocutions (e.g., bird deterrents).

2.4.2.10 Interaction with Existing Facilities

Numerous public and private improvements in the Project area could be encountered during construction. The most common would be related to agricultural land uses and include IID and private irrigation ditches and pipelines, IID drains, and private drains. Other facilities include pipelines for geothermal operations, power lines, roadways, and existing NWR wildlife structures. Alignments that conflicted with existing facilities would either be rerouted or the Project engineer would work with the facility owner to minimize the effects. For example, if the gravity brackish water pipeline were to intersect an agricultural drain, the drain would be rerouted to bypass the work area until the brackish water pipeline was placed and backfilled. The drain would then be restored to the pre-Project condition.

2.4.2.11 Vehicle Routes

Construction vehicles, including personal vehicles driven by workers, would use the established public roads. It is assumed that both commuters and haul trucks (tractor trailers) would approach the Project sites by traveling along State Route (SR)-86 or SR-111, both of which run primarily in a north-south direction and connect Imperial County's primary population centers. Tractor trailers hauling riprap material to the Project site likely would originate on the Salton Sea's northwestern side. To reach the New River sites, they would travel south on SR-86, exiting at West Bannister Road, where they would travel east for approximately 2 miles before heading north on Bruchard Road for about 4 miles. To reach the Alamo River sites, they would approach via SR-86/SR-78, exit the highway at Forrester Road (Highway 30), travel north, then continue north on Gentry Road. Attempts would be made to avoid the use of local roads adjacent to residences to the extent practicable. At West Sinclair Road, construction vehicles would turn east until reaching the Project area. Some of the public roads that would be used are not paved. In these cases, the roads would be watered during construction periods to reduce the dust emissions in accordance with Imperial County Air Pollution Control District's requirements.

2.4.2.12 Erosion Control

Standard erosion control measures would be used during construction to control off-site runoff of sediment that is loosened during construction.

2.4.3 Operations

Several permanent employees would be required to manage the ponds.

Proposed SCH operations are based on a proof-of-concept model. With this model, each pond or set of ponds would be operated under different conditions to test the success of the habitat with different pond characteristics. The final operations would be decided at the end of the proof-of-concept period, expected to occur in 2025. Appendix D provides examples of the range of operations for the SCH Project.

The main parameters subject to change include salinity, residence time[3], and depth. They can be controlled by changing the amount and salinity of water delivered to the SCH ponds, the outflow to the Salton Sea, and the total storage in the ponds. The potential range of these parameters includes:

- Salinity: Typical range of 20 to 40 ppt, occasionally up to 50 ppt
- Residence time: 2 to 32 weeks
- Depth: 4 to 6 feet at the exterior berm

The biotic community (e.g., algae, invertebrates, fish, and birds) would respond in varying ways to these operations and other environmental conditions. These operations, ecological responses to the operations, and other key indicators or events at the ponds (e.g., water temperature, bird die-offs), would be monitored, and any necessary adjustments to operations would be made through a monitoring and adaptive management program (Appendix E).

Fish and bird die-offs could occur periodically during pond operations; if dead birds were detected, they would be removed by DFG staff, in keeping with current practices at the Salton Sea.

2.4.4 Monitoring and Adaptive Management

Each SCH pond or set of ponds would be operated with different conditions to evaluate Project effectiveness and address key uncertainties about habitat function and potential impacts. A monitoring program would be implemented to collect data necessary to operate the ponds (e.g., flow and salinity), to evaluate their effectiveness (e.g., water quality parameters such as dissolved oxygen and temperature, presence and abundance of fish and bird species), and to assess status of threats (e.g., selenium concentration in water, sediment and bird eggs). Monitoring data would be collected in accordance with guidelines proposed for the Salton Sea Ecosystem Monitoring and Assessment Plan (USGS, in preparation). The frequency of data collection and evaluation would be guided by the purpose and need for monitoring. For example, operational triggers such as water supply flow rates would be monitored daily, while status of target resources would be monitored seasonally or annually. An overall data review would be conducted annually to evaluate SCH status and performance. A decision-making framework would be established to provide recommendations to SCH managers for maintaining or adjusting operations. Further details of the Monitoring and Adaptive Management Framework are provided in Appendix E.

2.4.5 Mosquito Control

A mosquito control plan would be implemented that addresses monitoring mosquito populations, the surveillance of mosquito-borne pathogens that cause diseases in human and wildlife, and the implementation of a treatment program to control mosquitoes at the SCH ponds and sedimentation basins at the outflows of the New River or Alamo River into the Salton Sea, if needed. Monitoring activities would be used to locate mosquito life stages (larvae, pupae, and adults), estimate their abundance, and determine species composition for the purpose of making treatment decisions. Disease surveillance would

[3] Residence time is the amount of time water entering the SCH ponds from the New or Alamo rivers and Salton Sea would reside in the ponds before being released to the Sea.

be used to detect the presence of mosquito-borne disease as part of a state-wide program. Mosquito treatments would be used to reduce the abundance of mosquito populations and associated mosquito-borne disease risk, as needed. The detailed plan is included in Appendix F.

2.4.6 Maintenance and Emergency Repairs

Ongoing maintenance would be an integral part of SCH operations. Activities would include maintaining the sedimentation basin, interior and exterior berms, protective riprap, pumping plants, and gravity diversion. Material excavated from the sedimentation basin would be used to construct habitat features or add to the berms. The gravity diversion would be maintained to keep the diversion facilities free of sediment and also monitor the river bed elevation to be aware of any downcutting that may occur as the Salton Sea's water level drops. The saline pumping facilities would be maintained to reduce fouling caused by the hypersaline water flowing through the pumps.

The potential for biological fouling at pipes and pumps exists and would be addressed in maintenance plans. Typically, clogging of pipes would be reduced by periodic cleaning and flushing of the pipes. However, if the buildup of organisms in pipelines became excessive, pipe replacement may be required. Draining the ponds would not be a routine maintenance activity, but may be required if a berm were damaged or under another type of emergency situation.

2.4.7 Best Management Practices

Best management practices would be used to minimize impacts on the environment during construction, operations, and maintenance. An Erosion and Sediment Control Plan and a Stormwater Pollution and Prevention Plan would be prepared and implemented to minimize impacts on water quality during construction and maintenance activities. Typical measures include preservation of existing vegetation to the extent feasible, installation of silt fences, use of wind erosion control (e.g., geotextile or plastic covers on stockpiled soil), and stabilization of site ingress/egress locations to minimize erosion.

Additionally, the Project would comply with the Imperial County Air Pollution Control District's Regulation VIII rules for dust control (general requirements, construction and earthmoving activities, bulk materials, open areas, and conservation management practices), which are required for all projects. This regulation is included in Appendix G. Additionally, during construction and maintenance, contractors and staff would implement the following measures to reduce emissions from fuel combustion and work activities:

- Limit idling of inactive equipment and queuing vehicles to 2 minutes;
- Use low or zero-emission vehicles, including construction vehicles;
- Promote riding sharing among construction workers or provide shuttle service to the Project site;
- Maintain vehicle and equipment engines to manufacturer's specifications;
- Maintain on-road vehicle and off-road equipment tire pressures to manufacturer specifications. Check and reinflate tires at regular intervals;
- Use lower-carbon fuels such as biodiesel blends where feasible;
- Use construction materials from local sources to the extent feasible; and
- Minimize vegetation removal necessary for construction to the extent feasible.

During facility operation, the operations and maintenance staff also would implement the following measures to reduce electrical demand, and thereby reduce greenhouse gas emissions from electric power generation needed to supply the SCH Project pumps:

- Check pump inlet screens regularly and remove accumulated debris as necessary;
- Operate the minimum number of pumps needed at any given time;
- Operate pumps only as necessary during the year; and
- Keep and reconcile logs of pump operation with monthly records of electric power usage (i.e., bills) to foster and promote energy awareness within the staff.

2.4.8 Decommissioning

The SCH Project would be designed to last for approximately 75 years. At the end of this period, or when funds are no longer available to operate the Project, the SCH facilities would be decommissioned. Decommissioning would require breaching the berms and removing the pumping plants and diversion structures and filling in the sedimentation basin. The environmental impacts of such activities would be speculative because it is not known what conditions would be present that far in the future. Thus, they are not analyzed in this document, although they likely would be less than those that would occur during the initial construction. Such activities would be subject to environmental review at the time they occurred.

2.5 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Alternative 1 would be located at the New River and would use independent and cascading pond units totaling approximately 3,130 acres. A gravity diversion would be used to provide river water to the ponds and would be located approximately 2 miles upstream of the SCH ponds. Alternative 1 would use the large bay to the northeast of the New River (East New) and the shoreline to the southwest (West New). Construction workers would include 2 managers, 3 foremen, 50 truck drivers, 6 laborers, and 36 heavy equipment operators, for a total of 97 workers. Features of Alternative 1 would include the following and are shown on Figure 2-6[4]:

River Water Source. Water would be diverted from the New River by gravity through a lateral structure approximately 2 miles upstream of the SCH ponds. The water would immediately flow to a sedimentation basin adjacent to the river. From the sedimentation basin, buried brackish water pipelines would convey the water to the SCH ponds. The alignment of the brackish water pipelines would be along the river or under roads. A metal bridge structure would be used to support the brackish water pipelines across the river.

Saline Water Source. The saline water pump would be located on a platform in the Salton Sea, north of the cascading pond unit at East New. Saline water would be conveyed to the SCH ponds through a pressurized pipeline.

Sedimentation Basin. Diverted water would flow to a sedimentation basin adjacent to the river, where it would be detained for approximately 1 day before being delivered by gravity to the SCH ponds through multiple brackish water pipelines. The basin would be 60 acres and be excavated below ground surface to approximately 20 feet. The basin would be fenced to prevent unauthorized access.

[4] The selected site would be surveyed prior to construction, and the boundaries shown on Figures 2-6 through 2-11 may be adjusted somewhat based on the results of these surveys.

Pond Layout. The pond layout includes two general areas: East New and West New, which contain independent pond units and cascading pond units.

Water Surface Elevation. The water surface elevation in the independent pond units would be a maximum of -228 feet msl and the maximum in the cascading units would be -230 feet msl. The maximum depth from the water surface in each pond unit to the downstream toe of the confining berm would be 6 feet. The water surface elevation in the cascading ponds would be from 2 to 4 feet lower than the elevation in the independent ponds.

Berm Configuration. Exterior berms would form the northern boundary of the cascading pond units and a cascade berm would divide the independent and cascade pond units. Overflow pipes would be present in the intermediate berm that would allow water to drop 2 feet into the cascading pond. The exterior berm would be placed at an elevation of -236 feet msl, and the intermediate berm would be placed at an elevation of -234 feet msl.

Pond Connectivity. Interior berms would subdivide the independent pond units, and gated control structures would be present in the interior berms to allow controlled flow between individual ponds. Each individual pond would have an ungated overflow structure connected directly to the Sea. Each overflow pipe would be sized to handle the overflow from a 100-year rainfall on the pond.

Borrow Source. The source of material for the berms would be a combination of shallow excavations in the independent units and an excavation trench along the cascade and exterior berms. The exterior berm would be constructed from a floating unit, and the cascade berm would be constructed using land-based equipment such as an excavator.

Agricultural Drainage and Natural Runoff. Agricultural drains operated by IID terminate at the beach along the southern end of the independent pond units. This drainage would be collected in an interception ditch. Natural runoff from watersheds to the southwest of the SCH ponds is also present in two drains that intercept the Project. The exterior berms would be aligned so as to not interrupt the flowpath of the occasional stormflows from these watersheds to the Sea. The exterior berms at West New would stop before a drainage channel that enters the Sea from the south.

Tailwater Return. A tailwater return pump could be placed in the saline water delivery line within the cascading pond unit in East New.

Pond Size. The individual ponds would range from 90 to 630 acres.

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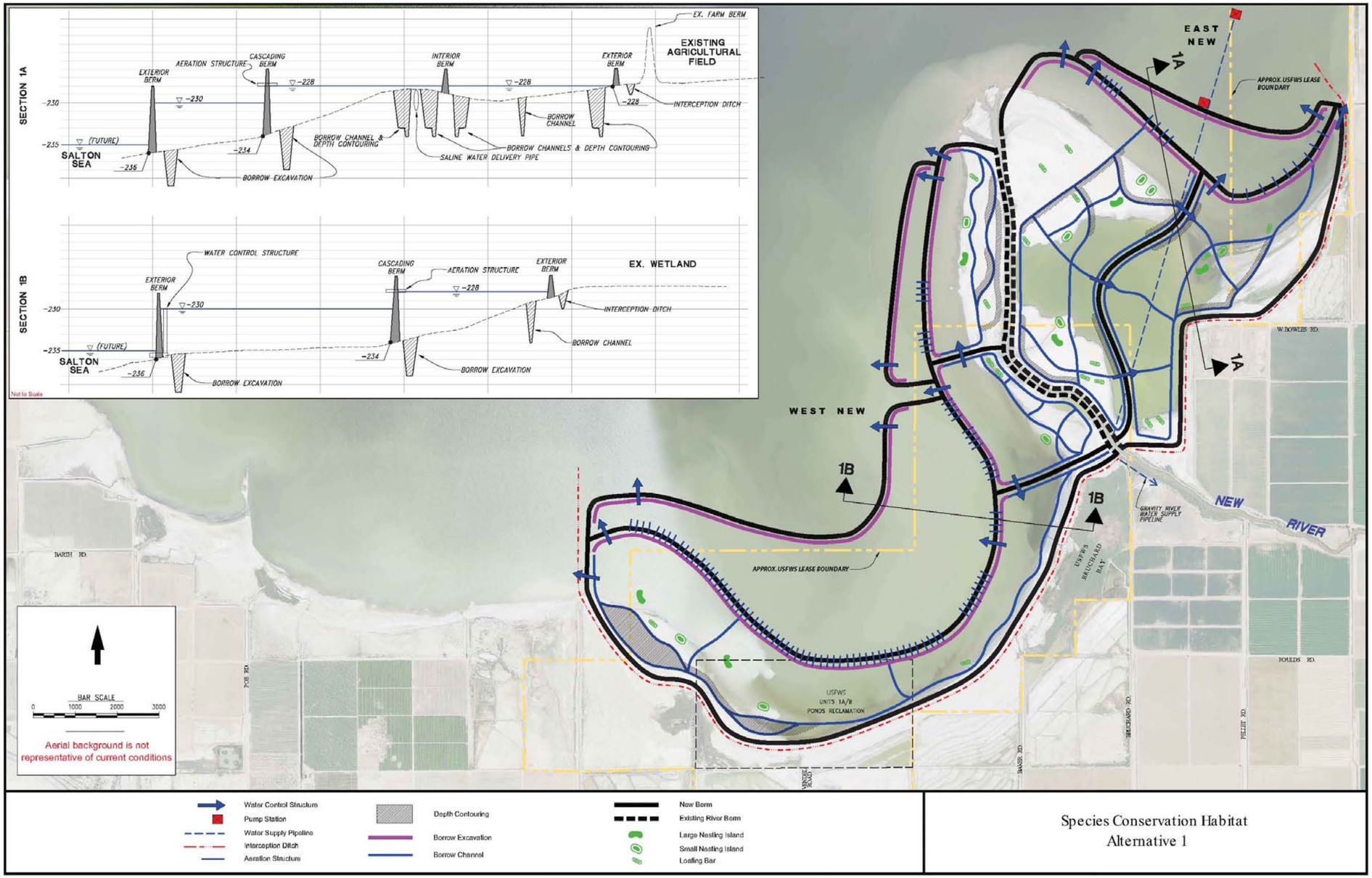

Figure 2-6 Conceptual Layout of Alternative 1

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2.6 Alternative 2 – New River, Pumped Diversion

Alternative 2 would be located at the New River and would use independent pond units totaling approximately 2,670 acres. The river diversion would be a pumped diversion located at the SCH site. Alternative 2 would use the large bay to the northeast of the New River (East New), the shoreline to the southwest (West New), and the shoreline continuing west (Far West New). Construction workers would include 2 managers, 2 foremen, 40 truck drivers, 6 laborers, and 27 heavy equipment operators, for a total of 77 workers. Features of Alternative 2 would include the following and are shown on Figure 2-7:

River Water Source. Water would be pumped from the New River at the SCH Project's southern edge using a low-lift pump to a sedimentation basin on each side of the river. A metal bridge structure would be used to support the diversion pipes across the river.

Saline Water Source. The saline pump would be located to the north of West New on a structure in the Salton Sea. Water would be delivered to the pond intakes through a pressurized pipeline.

Sedimentation Basin. Two sedimentation basins would be included in Alternative 2. Each one would be located within the SCH Project area and would serve the pond units east and west of the New River. Water would be released from each basin to a distribution system serving the individual ponds. The basins would total 40 acres and would be fenced to prevent unauthorized access.

Pond Layout. Alternative 2 would consist of several independent pond units at East New, West New, and Far West New. Within each pond unit, interior berms would form individual ponds. The pond at Far West New would receive its water supply from a pipeline from West New.

Water Surface Elevation. The water surface elevation in the ponds would be a maximum of -228 feet msl. The maximum depth from the water surface in each pond unit to the downstream toe of the confining berm would be 6 feet.

Berm Configuration. Exterior berms would be placed at an elevation of -234 feet msl to separate the ponds from the Sea.

Pond Connectivity. Interior berms would subdivide the independent pond units and gated control structures would be present in the interior berms to allow controlled flow between individual ponds. Each individual pond would have an ungated overflow structure that would connect directly to the Sea with an overflow pipe that would be sized to handle the overflow from a 100-year rainfall on the pond.

Borrow Source. The borrow source for berm material would be from excavation trenches along the exterior berm, shallow excavations, and borrow swales. The borrow swales would create deeper channels within an individual pond.

Agricultural Drainage and Natural Runoff. Agricultural drains operated by IID terminate at the beach along the southern end of the independent pond units. This drainage would be collected in an interception ditch. Natural runoff from watersheds to the southwest of the SCH Project is also present in two drains that intercept the Project. The exterior berms would be aligned so as to not interrupt the flowpath of the occasional stormflows from these watersheds to the Sea.

Tailwater Return. A tailwater system could be provided for one side of the SCH Project.

Pond Size. The sizes of the individual ponds would range from 160 to 620 acres.

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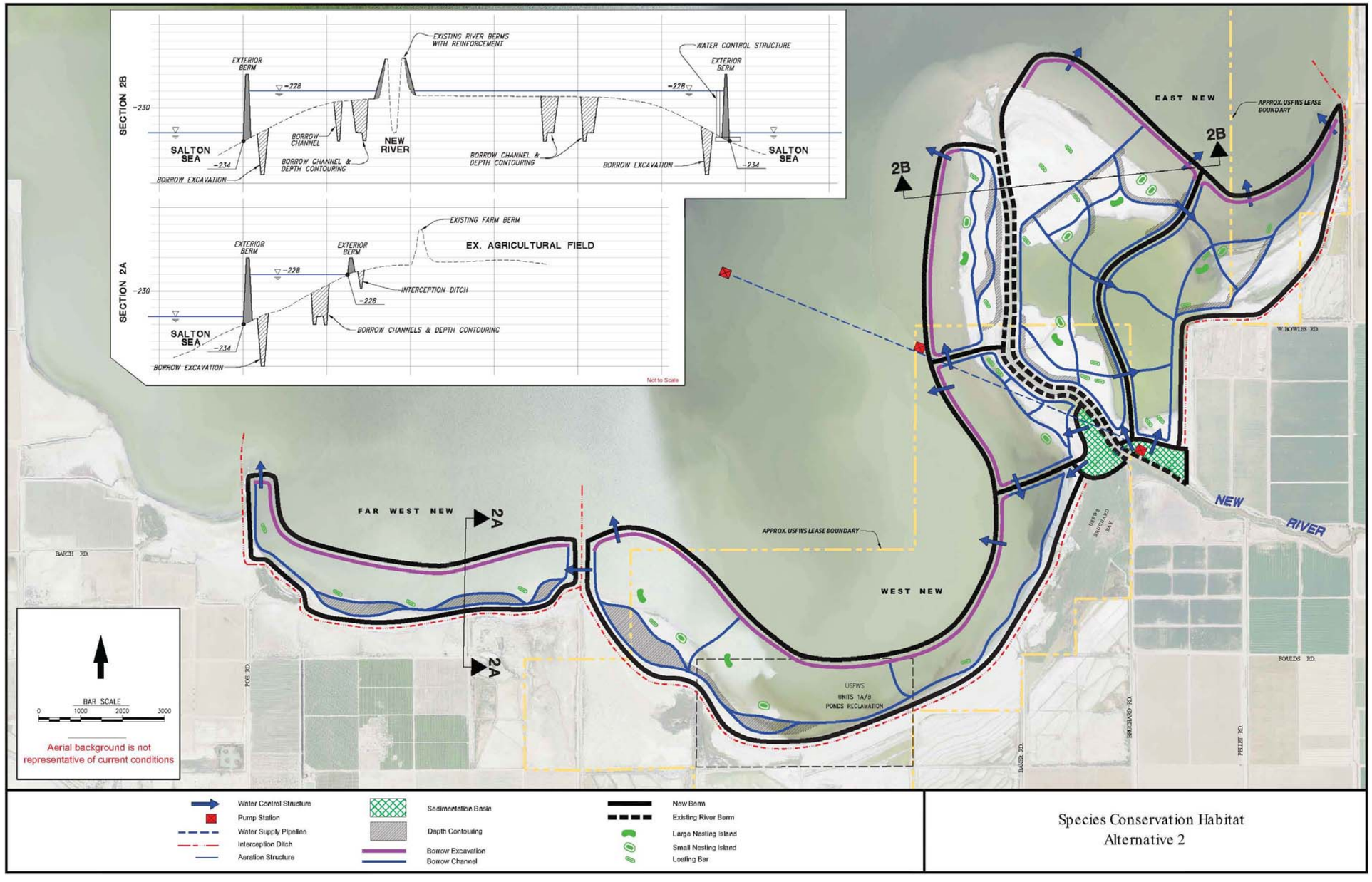

Figure 2-7 Conceptual Layout of Alternative 2

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2.7 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Alternative 3 would be located at the New River and would use independent pond and cascading pond units totaling approximately 3,770 acres. This is the Natural Resources Agency's preferred alternative; the Corps has yet to determine its preferred alternative. The river diversion would be a pumped diversion located at the SCH pond site. Alternative 3 would use the large bay to the northeast of the New River (East New), the shoreline to the southwest (West New), and the shoreline continuing to the west (Far West New). Cascading ponds would be attached to each of the pond units. Construction workers would include 2 managers, 3 foremen, 60 truck drivers, 6 laborers, and 44 heavy equipment operators, for a total of 115 workers. Features of Alternative 3 would include the following and are shown on Figure 2-8:

River Water Source. Water would be pumped from the New River at the SCH Project's southern edge using a low-lift pump to a sedimentation basin on each side of the river. A metal bridge structure would be used to support the diversion pipes across the river.

Saline Water Source. The saline pump would be located to the north of East New on a structure in the Salton Sea. Water would be delivered to the pond intakes through a pressurized pipeline.

Sedimentation Basin. Two sedimentation basins would be used for Alternative 3 and would be located within the SCH Project area. They would serve the pond units east and west of the New River. Water would be released from each basin to a distribution system serving the individual ponds. The basins would total 70 acres and would be fenced to prevent unauthorized access.

Pond Layout. Alternative 3 would consist of several independent pond units at Far West New, West New, and East New. Within each pond unit, interior berms form individual ponds. The ponds at Far West New receive their water supply from a pipeline from West New. Cascading ponds would be connected to each of the pond units. These cascading ponds would drain to the Sea.

Water Surface Elevation. The water surface elevation in the ponds would be a maximum of -228 feet msl. The maximum depth from the water surface in each pond unit to the downstream toe of the confining berm would be 6 feet. The water surface elevation in the cascading ponds would be from 2 to 4 feet lower than the elevation in the independent ponds.

Berm Configuration. Exterior berms would be placed at an elevation of -234 feet msl to separate the ponds from the Sea. The cascading berms would be placed at elevations of -236 or -238 feet depending on the pond location, site conditions, and the Sea elevation at the time of construction.

Pond Connectivity. Interior berms would subdivide the independent pond units, and gated control structures would be present in the interior berms to allow controlled flow between individual ponds. Each individual pond would have an ungated overflow structure that connects directly to the Sea with an overflow pipe that would be sized to handle the overflow from a 100-year rainfall on the pond.

Borrow Source. The borrow source for berm material would be from excavation trenches along the exterior berm, shallow excavations, and borrow swales. The borrow swales would create deeper channels within an individual pond.

Agricultural Drainage and Natural Runoff. Agricultural drains operated by IID terminate at the beach along the southern end of the independent pond units. This drainage would be collected in an interception ditch. Natural runoff from watersheds to the southwest of the SCH Project is also present in two drains that intersect the Project. The exterior berms would be aligned so as to not interrupt the flowpath of the occasional stormflows from these watersheds to the Sea.

Tailwater Return. A tailwater system could be provided for the SCH Project.

Pond Size. The sizes of the individual ponds would range from 150 to 720 acres.

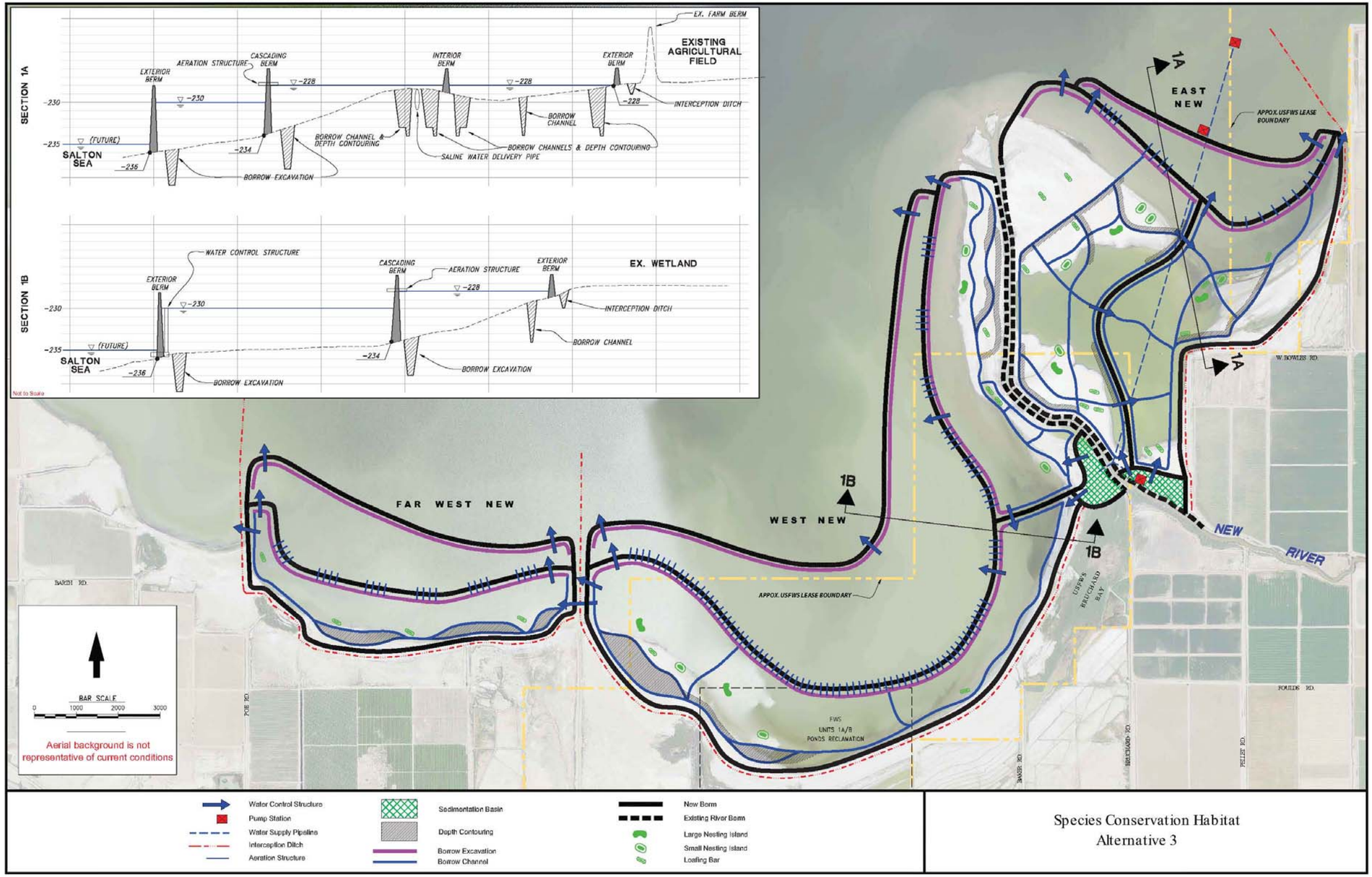

Figure 2-8 Conceptual Layout of Alternative 3

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2.8 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Alternative 4 would be located at the Alamo River and would use independent ponds and a cascading pond unit totaling approximately 2,290 acres. The river diversion would be a gravity diversion located approximately 3.5 miles upstream of the SCH ponds. Alternative 4 would use Morton Bay. Construction workers would include 2 managers, 2 foremen, 20 truck drivers, 6 laborers, and 17 heavy equipment operators, for a total of 47 workers. Features of Alternative 4 would include the following and are shown on Figure 2-9:

River Water Source. Water would be diverted from the Alamo River by gravity through a lateral structure approximately 3.5 miles upstream of the SCH ponds. The water would immediately flow to a sedimentation basin adjacent to the river.

Saline Water Source. The saline water pump would be located at Red Hill west of the pond units. A channel would be excavated from the Salton Sea to the pump station location. The pipeline would travel around Red Hill to the distribution point through a pressurized pipeline.

Sedimentation Basin. Diverted water would flow to a sedimentation basin adjacent to the river and would be detained for approximately 1 day before being delivered by gravity to the SCH ponds through multiple brackish water pipelines. The basin would be 37 acres and would be fenced to prevent unauthorized access.

Pond Layout. Alternative 4 would use an independent pond unit and a cascading pond unit at Morton Bay. The independent pond would be subdivided into two individual ponds.

Water Surface Elevation. The maximum water surface elevation in the independent ponds would be -228 feet msl, and the maximum water surface for the cascading pond would be -233 feet msl. The maximum depth from the water surface in each pond unit to the downstream toe of the confining berm would be 6 feet.

Berm Configuration. Exterior berms would form the western boundary of the cascading pond unit and a cascading berm would divide the independent and cascading pond units. Overflow pipes would be present in the intermediate berm that would allow water to drop 5 feet into the cascading pond. The intermediate berm would be placed at an elevation of -234 feet msl. The exterior berm would be located on the Sea side of Mullet Island with a base elevation of -239 feet.

Pond Connectivity. Interior berms would subdivide the independent pond unit, and gated control structures would be present in the interior berms to allow controlled flow between individual ponds. Each individual pond would have an ungated overflow structure that connected directly to the Sea. Each overflow pipe would be sized to handle the overflow from a 100-year rainfall on the pond.

Borrow Source. The borrow source for berm material would be excavation trenched along the exterior berm of the cascading pond, shallow excavations, and borrow swales. The borrow swales would create deeper channels within an individual pond.

Agricultural Drainage and Natural Runoff. Agricultural drains operated by IID terminate at the beach along the eastern side of the Morton Bay independent pond unit. This drainage would be collected in an interception ditch.

Tailwater Return. A tailwater system could be provided for the SCH Project.

Pond Size. The sizes of the individual ponds would range from 420 to 1,020 acres.

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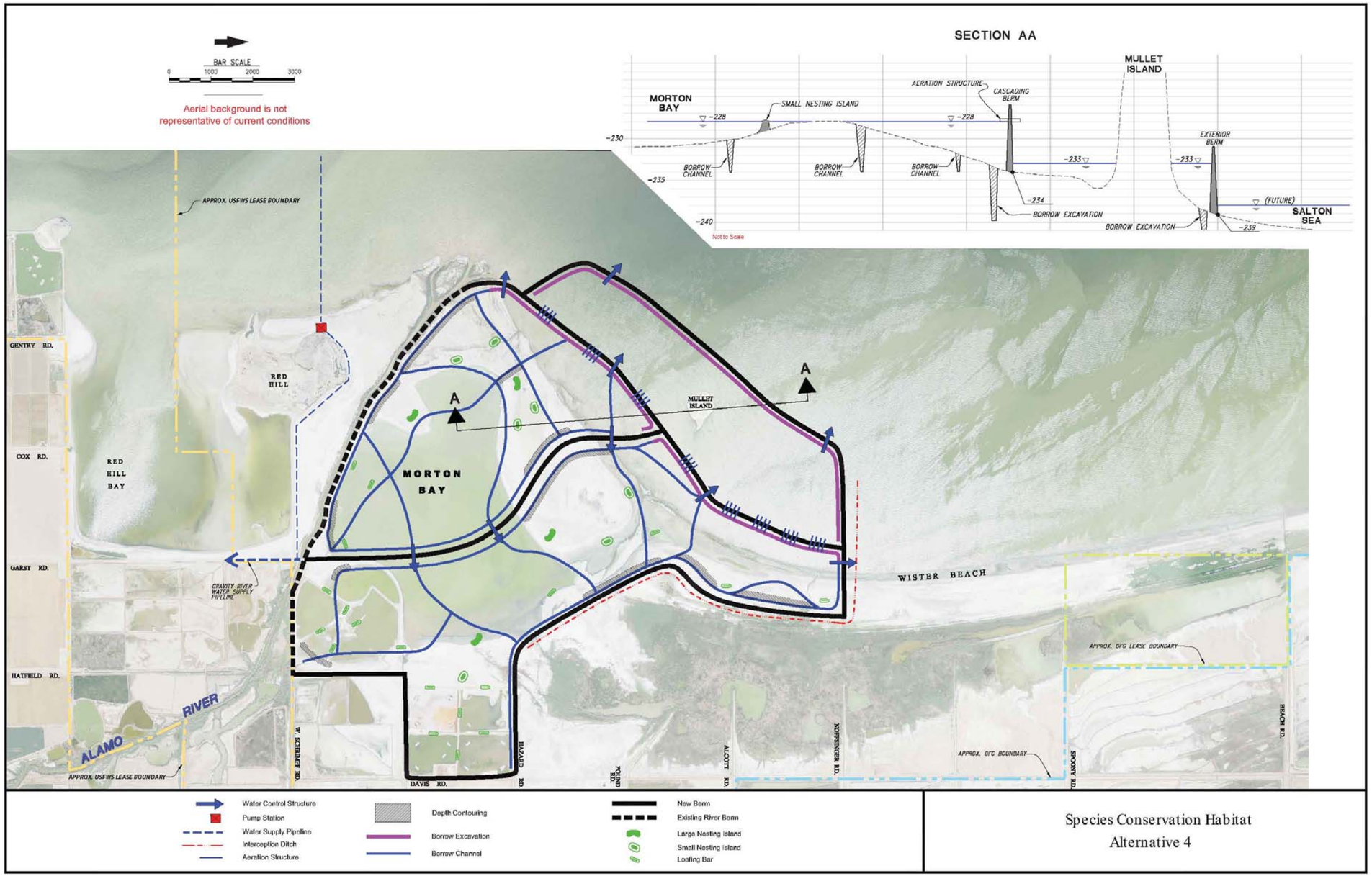

Figure 2-9 Conceptual Layout of Alternative 4

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2.9 Alternative 5 – Alamo River, Pumped Diversion

Alternative 5 would be located at the Alamo River, would use independent pond units, and would consist of approximately 2,080 acres. The river diversion would be a low-lift pumped diversion located at the SCH pond site. Alternative 5 would use Morton Bay to the northeast of the Alamo River. Construction workers would include 2 managers, 2 foremen, 18 truck drivers, 6 laborers, and 15 heavy equipment operators, for a total of 58 workers. Features of Alternative 5 would include the following and are shown on Figure 2-10.

River Water Source. Water would be pumped from the Alamo River at the eastern edge of the SCH ponds using a low-lift pump to a sedimentation basin on the north side of the river.

Saline Water Source. The saline water pump would be located in the Sea west of Red Hill. The pipeline would travel around Red Hill to the distribution point through a pressurized pipeline.

Sedimentation Basin. One sedimentation basin would be located within the SCH ponds. Water would be released from the basin to a distribution system serving the individual ponds. The basin would be 30 acres and would be fenced to prevent unauthorized access.

Pond Layout. Alternative 5 would consist of independent pond units at Morton Bay, and Wister Beach. An interior berm that forms individual ponds would be present within the Morton Bay independent pond unit.

Water Surface Elevation. The water surface elevation in the ponds would be a maximum of -228 feet msl. The maximum depth from the water surface in each pond unit to the downstream toe of the confining berm would be 6 feet.

Berm Configuration. Berms would be placed at an elevation of -234 feet msl to separate the ponds from the Sea. The exterior berm would not include Mullet Island.

Pond Connectivity. Interior berms would subdivide the independent pond units, and gated control structures would be present in the interior berms to allow controlled flow between individual ponds. Each individual pond would have an ungated overflow structure that would connect directly to the Sea. Each overflow pipe would be sized to handle the overflow from a 100-year rainfall on the pond.

Borrow Source. The borrow source for berm material would be from excavation trenches along the exterior berm, shallow excavations, and borrow swales. The borrow swales would create deeper channels within an individual pond.

Agricultural Drainage and Natural Runoff. Agricultural drains operated by IID terminate at the beach along the eastern side of the Morton Bay independent pond unit. This drainage would be collected in an interception ditch.

Tailwater Return. A tailwater system could be provided for the SCH Project.

Pond Size. The sizes of the individual ponds would range from 470 to 720 acres.

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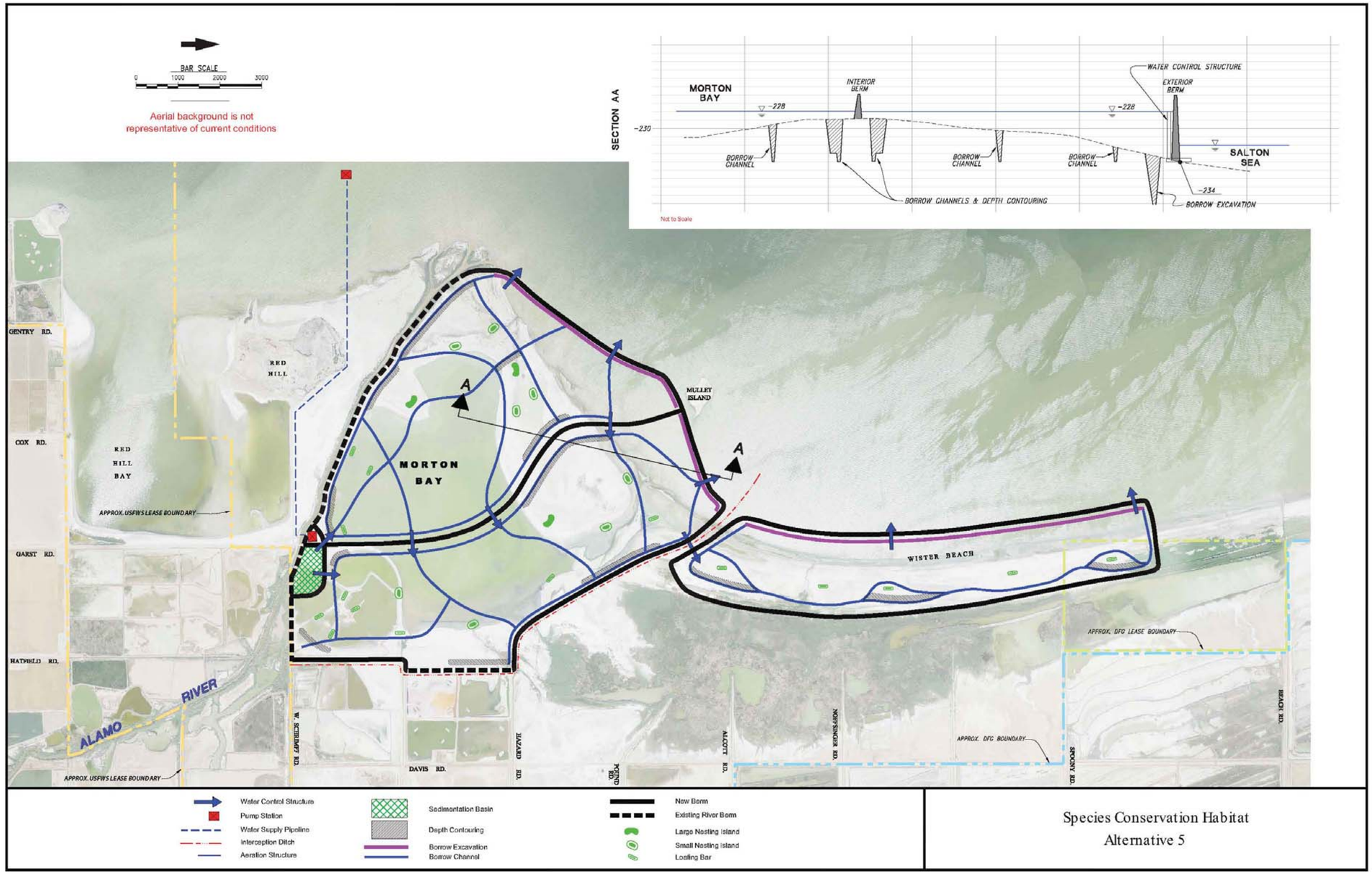

Figure 2-10 Conceptual Layout of Alternative 5

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2.10 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Alternative 6 would be located at the Alamo River, would use independent and cascading pond units, and would consist of approximately 2,940 acres. The river diversion would be a low-lift pumped diversion located at the SCH pond site. Alternative 6 would use Morton Bay to the northeast of the Alamo River and Wister Beach. Construction workers would include 2 managers, 2 foremen, 24 truck drivers, 6 laborers, and 24 heavy equipment operators, for a total of 58 workers. Features of Alternative 6 would include the following and are shown on Figure 2-11.

River Water Source. Water would be pumped from the Alamo River at the eastern edge of the SCH ponds using a low-lift pump to a sedimentation basin on the north side of the river.

Saline Water Source. Saline water would be supplied from a pumping station located on a platform in the Salton Sea northwest of Morton Bay.

Sedimentation Basin. A sedimentation basin would be located within the SCH ponds. Water would be released from the basin to a distribution system serving the individual ponds. The basin would be 50 acres and would be fenced to prevent unauthorized access.

Pond Layout. Alternative 6 would consist of independent pond units at Morton Bay and Wister Beach, and a cascading pond on each. Interior berms that form individual ponds would be present within the Morton Bay independent pond unit.

Water Surface Elevation. The maximum water surface elevation in the independent ponds would be -228 feet msl, and the maximum water surface for the cascading ponds would be -233 feet msl. The maximum depth from the water surface in each pond unit to the downstream toe of the confining berm would be 6 feet.

Berm Configuration. Exterior berms would form the western boundaries of the cascading pond units and cascading berms would divide the independent and cascading pond units. Overflow pipes would be present in the intermediate berms that would allow water to drop 5 feet into the cascading pond. The intermediate berms would be placed at an elevation of -234 feet msl. The exterior berm would be located on the Sea side of Mullet Island with a base elevation of -239 feet.

Pond Connectivity. Interior berms would subdivide the independent pond units, and gated control structures would be present in the interior berms to allow controlled flow between individual ponds. Each individual pond would have an ungated overflow structure that connected directly to the Sea. Each overflow pipe would be sized to handle the overflow from a 100-year rainfall on the pond.

Borrow Source. The borrow source for berm material would be from excavation trenches along the exterior berm, shallow excavations, and borrow swales. The borrow swales would create deeper channels within an individual pond.

Agricultural Drainage and Natural Runoff. Agricultural drains operated by IID terminate at the beach along the northeast side of the Morton Bay independent pond unit. This drainage would be collected in an interception ditch.

Tailwater Return. A tailwater system could be provided for the SCH Project.

Pond Size. The sizes of the individual ponds would range from 340 to 680 acres.

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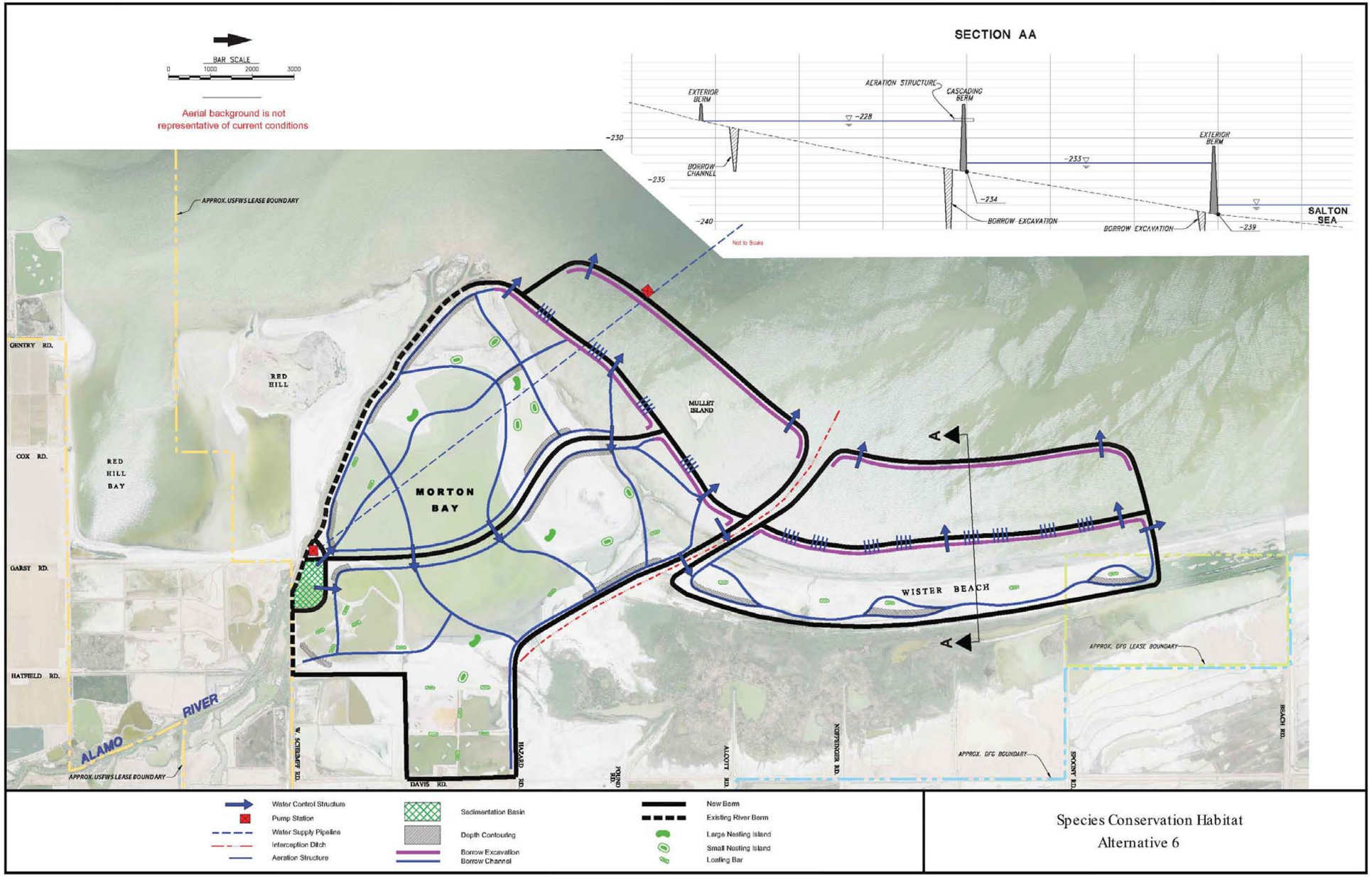

Figure 2-11 Conceptual Layout of Alternative 6

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2.11 References

California Department of Water Resources (DWR) and California Department of Fish and Game (DFG). 2007. Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report.

United States Geological Survey. In preparation. Salton Sea ecosystem monitoring and assessment plan.

2.12 Personal Communications

Schoneman, Christian. 2011. Project Leader, Sonny Bono Salton Sea National Wildlife Refuge Complex. Email to Sarah Bumby, Cardno ENTRIX, April 19.

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SECTION 3

Affected Environment, Impacts, and Mitigation Measures

3.0 INTRODUCTION

This section introduces the key principles followed in preparing this Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR), discusses differences between California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) baselines, describes the duty to mitigate significant environmental impacts and the structure of the resource sections included in the remainder of Section 3, and discusses the terminology used in the environmental impact analysis.

3.0.1 Key Principles Guiding Preparation of this Draft Environmental Impact Statement/Environmental Impact Report

3.0.1.1 Emphasis on Significant Environmental Effects

This Draft EIS/EIR focuses on the significant environmental effects of the Species Conservation Habitat Project (SCH Project or Project) alternatives and their relevance to the decision-making process. NEPA requires the lead Federal agency to rely on a "scientific and analytical basis for the comparison of alternatives" (40 Code of Federal Regulations [CFR] 1502.16) in making its decisions. Commonly, when preparing a joint document, the lead Federal agency will adopt the CEQA significance thresholds as its scientific basis, unless otherwise noted.

"Environmental impacts," as defined by CEQA, include physical effects on the environment. In this document, the term is used synonymously with the term "environmental effects" under NEPA. The CEQA Guidelines (section 15360) define the "environment" as follows: "The physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."

This definition does not include strictly economic impacts (e.g., changes in property values) or social impacts (e.g., a particular group of persons moving into an area). The CEQA Guidelines (section 15131[a]) state that "economic or social effects of a project shall not be treated as significant effects on the environment." However, economic or social effects are relevant to physical effects in two situations. In the first, according to section 15131(a) of the CEQA Guidelines, "An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes…to physical changes caused in turn by the economic or social changes." In other words, if an economic or social impact leads to a physical impact, this ultimate physical impact must be evaluated in the EIR. In the second instance, according to section 15131(b) of the CEQA Guidelines: "Economic or social effects of a project may be used to determine the significance of physical changes caused by the project." For example, the closure and demolition of a fully occupied commercial building could be considered more significant than the demolition of a similar vacant building, even though the physical effects are the same.

3.0.1.2 Forecasting

In this Draft EIS/EIR, the lead agencies have made their best efforts to predict and evaluate the reasonable, foreseeable, direct, indirect, and cumulative environmental impacts of the proposed Project alternatives. NEPA and CEQA do not require the lead agencies to engage in speculation about impacts that are not reasonably foreseeable (CEQA Guidelines sections 15144 and 15145). In these instances, CEQA does not require a worst-case analysis. Similarly, NEPA does not require a worst-case analysis when confronted with incomplete or unavailable information (40 CFR section 1502.22).

3.0.1.3 Reliance on Environmental Thresholds and Substantial Evidence

The identification of impacts as "significant" or "less than significant" is one of the important functions of an EIS/EIR. While impacts determined to be "less than significant" need only be acknowledged as such, an EIR must identify mitigation measures for any impact identified as "significant." In preparing this document, the lead agencies have based their conclusions about the significance of environmental impacts on identifiable thresholds and have supported these conclusions with substantial scientific evidence.

The criteria for determining the significance of environmental impacts in this analysis are described in each resource section in Section 3. The "threshold of significance" for a given environmental effect is the level at which the lead agencies find a potential effect of the proposed Project alternatives to be significant. "Threshold of significance" can be defined as an "identifiable quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant (CEQA Guidelines, section 15064.7(a)).

3.0.1.4 Disagreement among Experts

It is possible that evidence that might raise disagreements will be presented during the public review of the Draft EIS/EIR. Such disagreements will be noted and will be considered by the decision makers during the public hearing process. However, to be adequate under CEQA and NEPA, the EIS/EIR need not resolve all such disagreements. In rendering a decision on a project where a disagreement exists among experts, the decision makers are not obligated to select the most conservative, environmentally protective, or liberal viewpoint. Decision makers might give more weight to the views of one expert than to those of another and need not resolve a dispute among experts. In their proceedings, the decision makers must consider the comments received and address any objections, but need not follow said comments or objections so long as the decision makers state the basis for their decision supported by substantial evidence.

3.0.2 CEQA and NEPA Baselines

3.0.2.1 CEQA Baseline

Section 15125 of the CEQA Guidelines requires EIRs to include a description of the physical environmental conditions in the vicinity of a proposed Project that exists at the time of the Notice of Preparation. The conditions existing at the time that the Notice of Preparation was circulated for review are described in Sections 3.1 through 3.21. These environmental conditions constitute the baseline physical conditions against which the CEQA lead agency determines if an impact is significant.

3.0.2.2 NEPA Baseline

In analyzing a proposed project in a joint CEQA/NEPA format, the United States Army Corps of Engineers (Corps) must distinguish the scientific and analytical basis for its decisions separately from the CEQA lead agency decision. Fundamental to this analysis is establishing the NEPA baseline. For the

SCH Project, the NEPA baseline for determining the significance of impacts is the set of conditions defined by examining the full range of construction and operational activities the applicant (the Natural Resources Agency) could implement and is likely to implement absent a permit from the Corps. The NEPA baseline also includes other actions that would affect inflows into the Salton Sea and facilities construction required as part of the Imperial Irrigation District Water Conservation and Transfer Project. These are described under the No Action Alternative. The determination is based on direct statements and empirical data from the applicant, as well as on the judgment and experience of the Corps. Unlike the CEQA baseline, which is defined by conditions at a point in time, the NEPA baseline is not bound by statute to a "flat" or "no-growth" scenario. The significance of impacts associated with implementation of the proposed Project or alternative is defined by comparison to impacts that would occur under NEPA baseline conditions (i.e., the increment).

For most impacts, no meaningful difference exists they are compared to the CEQA and NEPA baselines, particularly when impacts would cease when construction ended, because no substantive differences would exist between the current conditions and those that would occur several years into the future. For other resources, such as hydrology, biological resources, air quality (fugitive dust emissions), and aesthetics, a meaningful difference exists between current conditions and those that would occur in the future as the Salton Sea recedes and water quality deteriorates.

3.0.3 Duty to Mitigate

Under the Council on Environmental Quality regulations, 40 CFR 1502.14 requires lead agencies to consider appropriate mitigation measures, and 1505.3 requires that any mitigation measures adopted as part of the Record of Decision shall be implemented.

According to CEQA Guidelines, section 15126.4(a), each significant impact identified in an EIR must include a discussion of feasible mitigation measures that would avoid or substantially reduce the significant environmental effect. To reduce significant effects, mitigation measures must avoid, minimize, rectify, reduce, eliminate, or compensate for a given impact of the proposed Project.

CEQA Guidelines, section 15041, grants a lead agency the authority to require feasible changes in the project that would substantially lessen or avoid a significant effect on the environment. Public agencies, however, do not have unlimited authority to impose mitigation. Where another law grants an agency discretionary power, CEQA supplements those discretionary powers by authorizing the agency to use the powers to mitigate or avoid significant effects on the environment when it is feasible to do so with respect to projects subject to the powers of the agency (CEQA Guidelines, section 15040).

3.0.4 Structure of Resource Sections

The remainder of Section 3 describes the environmental resources that could be affected by the SCH Project; the potential impacts on those resources that would occur if the SCH Project were not implemented (i.e., the No Action Alternative), as well as the impacts of the six Project alternatives; mitigation measures that would reduce the severity of significant Project impacts, and the significance of the residual impacts that would remain after the application of such mitigation measures. The resources include those that are typically evaluated under both NEPA and CEQA, as well as those that are generally required for NEPA documents, such as Indian Trust Assets, Environmental Justice, and Socioeconomics.

The level of detail for each resource is commensurate with the types of impacts expected to occur. For example, no Indian Trust Assets are present in the area that would be affected by the SCH Project, so the discussion of this resource is brief. More extensive discussions are provided for biological resources because of the relative complexity and importance of the resources affected. Sections addressing resources that are considered in detail are organized as follows:

- **Introduction.** This section includes a description of the types of issues to be addressed in the subsequent analysis. It also includes a description of the study area for that resource. The study area is the geographical area within which Project-related impacts could occur. For some resources, such as noise, impacts are highly localized and the study area includes only those locations close to or within the footprint of construction activities. Impacts on other resources, such as socioeconomics and air quality, would affect a broader region, and the description of the affected environment for these resources is necessarily broader, as well. The introduction also includes a table that summarizes the significance of impacts for each alternative when compared to both existing conditions and the No Action Alternative, along with mitigation measures, as appropriate.
- **Regulatory Requirements.** This section provides an overview of Federal, state, and local regulations that are related to the impact analysis for each resource.
- **Affected Environment.** This section describes the conditions within the study area as they existed at the time that the Notice of Intent and Notice of Preparation were issued (Summer 2010). The most current information was used, which in some cases, may not correspond exactly to that date.
- **Impact Analysis Methodology.** The methods by which impacts were evaluated are described.
- **Impact Significance Criteria.** Criteria against which the significance of Project impacts was evaluated are provided for each resource that could be affected by the Project. The threshold of significance for a given environmental impact is the level at which the Corps or the Natural Resources Agency finds a potential effect of the proposed Project or alternative to be significant. The significance criteria are largely based on CEQA Guidelines, Appendix G and have been modified where appropriate to address impacts specific to the SCH Project and to meet Federal requirements. Significance criteria also have been developed for those resources that are not included in CEQA Guidelines, Appendix G (Environmental Justice and Socioeconomics). The Corps has adopted the CEQA thresholds for purposes of this Draft EIS/EIR to achieve its NEPA responsibilities, unless otherwise noted in particular sections of the document.
- **Application of Significance Criteria.** This section describes how each of the significance criteria described in the preceding section is or is not applicable to the SCH Project. Those that are not applicable (e.g., those related to impacts on forest lands) are not considered further.
- **No Action Alternative.** The description of the impacts resulting from the No Action Alternative is based on the No Action Alternative-CEQA Conditions provided in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources and California Department of Fish and Game 2007). This alternative is intended to reflect those conditions that currently occur plus changes that are reasonably expected to occur in the foreseeable future if none of the Project alternatives is implemented, based on current plans and consistent with available infrastructure and community services. The No Action Alternative is the same as No Federal Action. It is a description of what would occur if the Corps did not issue a permit or otherwise approve the SCH Project. Because the Project is a water-dependent activity, the lead agencies agree that no portion of the Project could be implemented without the issuance of a Corps permit. Therefore, the No Action Alternative is also the NEPA baseline.
- **Alternatives 1 through 6.** The environmental impacts that would result from implementing each of the six Project alternatives are described. Each section describes impacts that would be significant, less than significant, and beneficial (where appropriate). Impacts from construction, operations, and maintenance are addressed, as are direct, indirect, permanent, and temporary impacts. Each impact is given an alphanumeric number. Impacts are compared to both the existing conditions and the No Action Alternative. Mitigation measures are provided for each significant impact where feasible and also are given an alphanumeric number. The discussion of mitigation measures is followed by a

description of the significance of the residual impacts that would occur after the implementation of the mitigation measures.

- **References.** A list of the references and personal communications that are cited in each section is included at the end of the section.

3.0.5 Terminology Used in the Environmental Impact Analysis

As stated above, this document is a joint EIS/EIR, prepared under the direction of the Corps as the Federal lead agency and the Natural Resources Agency as the state lead agency. Both agencies have obligations to disclose all impacts facilitated by approval of the Project.

Under NEPA and CEQA, the terms "effects" and "impacts" are used synonymously (40 CFR section 1508.8). Direct impacts are those caused by the Project itself, and that occur at the same time and place. Examples of direct impacts are dust, noise, and traffic that would result from Project construction. Indirect impacts are those caused by the Project and are later in time or farther removed in distance, but are still reasonably foreseeable. Direct and indirect impacts can be either temporary or permanent. The Corps has slightly refined this terminology for use in its NEPA analyses, basing its impact analysis on the area subject to a Corps permit, which may or may not be different than that of the entire project. For example, the Corps' Standard Operating Procedures (2009), a national policy guidance document, defines direct impacts “as those that happen in direct response to the permitted activity" while "indirect impacts...are those removed in time and/or distance in relation to the permitted activity.” For this EIS/EIR, the impact areas are the same under NEPA and CEQA because no aspects of the SCH Project would be implemented in the absence of a Corps permit.

Regardless of the definitional differences, under both NEPA and CEQA, the Corps and Natural Resources Agency must identify and analyze all impacts resulting from a proposed project and its alternatives, whether direct or indirect, and identify feasible, reasonable, and practical mitigation measures to avoid or minimize those identified impacts. (See 40 CFR section 1502.16; CCR Title 14, sections15126.2 and 15126.4.) All impacts, whether classified as direct or indirect, must be analyzed at the same level and mitigation must be identified. To satisfy both the Corps and Natural Resources Agency's informational and analytical needs in one document, this EIS/EIR utilizes the following terms in analyzing the potentially significant impacts resulting from the Project:

- **No Impact.** A designation of no impact is given when no adverse changes in the environment are expected as a result of the Project.
- **Less-than-Significant Impact.** A Project impact is considered less than significant when it does not reach the impact threshold established in the significance criteria and, therefore, would not cause a substantial change in the physical environment. As a result, no mitigation is required or necessary.
- **Significant Impact.** A Project impact is considered significant if it would result in a substantial adverse change in the physical environment. Impact significance criteria (defined above) are identified for each resource, and Project impacts are evaluated in the context of these criteria.
- **Significant Unavoidable Impact.** A Project impact is considered significant and unavoidable if it would result in a substantial adverse change in the physical environment that cannot be feasibly/reasonably avoided or mitigated to a less-than-significant level if the selected project is approved and implemented. Under CEQA, a Statement of Overriding Considerations must be adopted if a proposed project results in one or more significant unavoidable impacts. NEPA has no similar "overriding considerations" requirement.
- **Beneficial Impact.** This impact is identified where the Project alternatives would create a positive change in environmental conditions.

- **Mitigation Measure.** Mitigation measures must be feasible, practical, reasonable, and roughly proportional to the impacts of a proposed project. The mitigation also must avoid, minimize, rectify and/or restore, reduce, or compensate for identified significant impacts to the physical environment. Mitigation includes:
    - Avoiding the impact altogether by not taking a certain action or parts of an action;
    - Minimizing the impact by limiting the degree or magnitude of the action and its implementation;
    - Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
    - Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
    - Compensating for the impact by replacing or providing substitute resources or environments.
- **Residual Impact.** The level of impact that would occur after the implementation of mitigation measures.
- **Cumulative Impacts.** Under CEQA, "cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CCR Title 14, section 15355). CEQA requires that cumulative impacts be discussed when the "project's incremental effect is cumulatively considerable" (CCR Title 14, section 15130(a)). NEPA regulations define "cumulative impact" as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR section 1508.7). NEPA states that "cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR section 1508.7). In this EIS/EIR, cumulative impacts resulting from the Project alternatives are addressed separately in Section 4.0, Cumulative Impacts.

3.0.6 References

U.S. Army Corps of Engineers (Corps). 2009. Standard Operating Procedures for the Regulatory Program. July 1.

3.1 AESTHETICS

3.1.1 Introduction

This section discusses the potential for the Species Conservation Habitat (SCH) Project to result in temporary and permanent changes in the visual environment near the New and Alamo rivers. The study area includes the locations from which views of the proposed SCH Project sites would be possible, including the southern portion of the Salton Sea and its shoreline, adjacent agricultural areas, the Sonny Bono Salton Sea National Wildlife Refuge (Sonny Bono NWR) and Imperial Wildlife Area, and public use areas at Red Hill. Although the Salton Sea can be viewed from hills and mountains farther away, the proposed Project sites would be viewed by most people from lands immediately adjacent to or within the study area boundary.

Table 3.1-1 summarizes the impacts of the six Project alternatives on aesthetic resources, compared to both the existing conditions and the No Action Alternative.

Table 3.1-1 Summary of Impacts on Aesthetics

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact AES-1: Project construction could temporarily degrade the scenic quality, character, or scenic vistas of the site and surrounding areas.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AES-2: The SCH ponds would enhance the scenic quality and character of the site and surrounding areas.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AES-4: Some construction activities may occur at night, requiring lighting.	Existing Condition	L	L	L	S	S	S	MM AES-1: Shield and direct construction lights away from Red Hill Park.
	No Action	L	L	S	S	S	S	Same as Existing Condition

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.1.2 Regulatory Requirements

No regulatory requirements pertain specifically to the aesthetic/visual environment of the Salton Sea. However, the Imperial County General Plan Conservation and Open Space Element (1993) and

Circulation and Scenic Highways Element (2008) include a number of goals and objectives intended to preserve visual resources and protect scenic highways in the county.

3.1.3 Affected Environment

Elements that influence the visual environment include topographic features such as landforms; the Salton Sea itself; vegetation patterns; human-made alterations to the landscape such as roads, public works projects, agricultural land uses, and structures; and wildlife. Photos showing the visual environment of the study area are shown in Figures 3.1-1 and 3.1-2. Key observation points (KOPs), which provide representative views of the visual environment, are described below. A photograph for each KOP, along with the location of each, is shown in Figure 3.1-3.

3.1.3.1 Project Vicinity

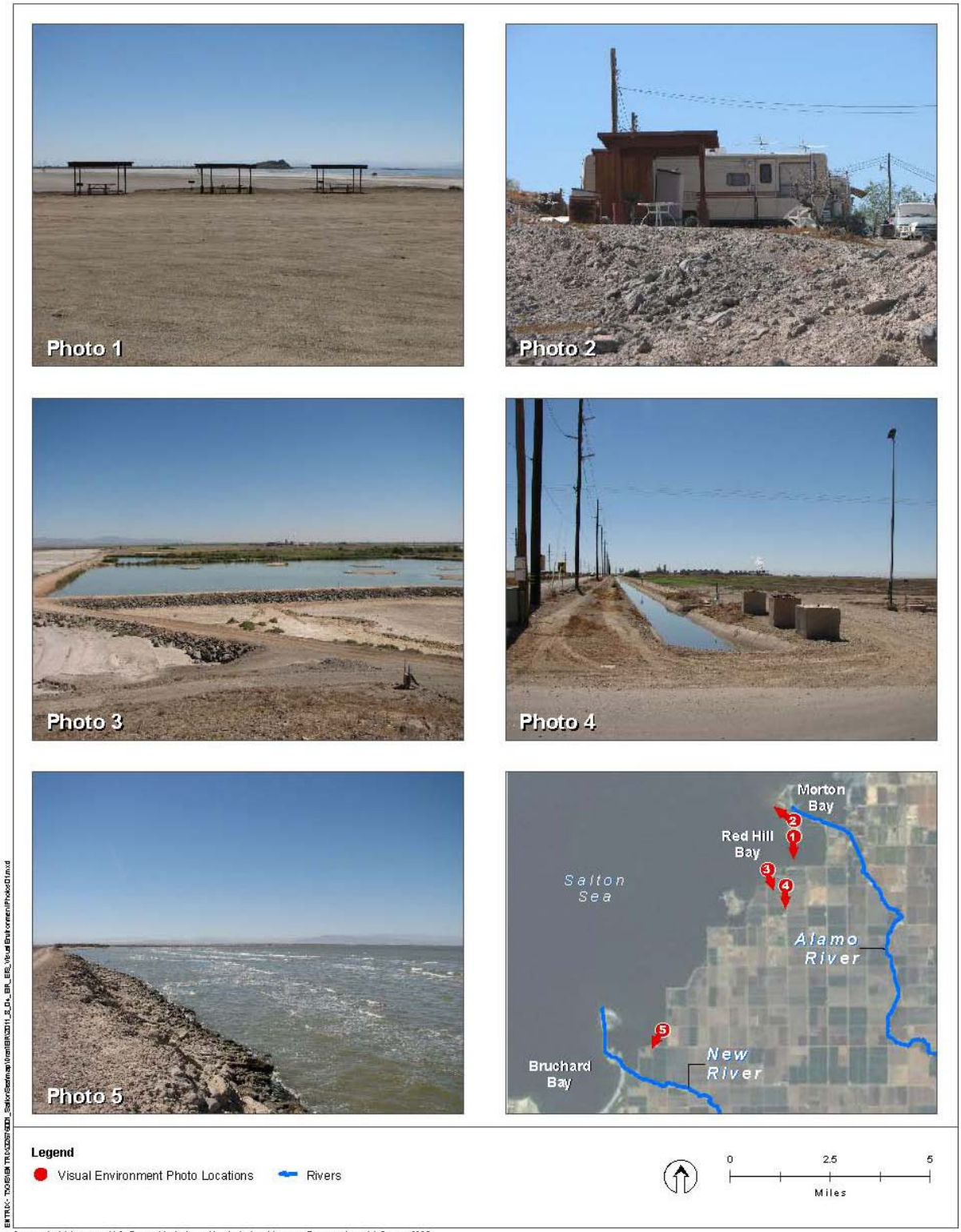
The New and Alamo rivers flow into the Salton Sea where the proposed SCH sites are located, forming river deltas that are significant visual elements within the region. Riparian vegetation and exposed shore (playa) dominate the delta areas. Vegetation is generally dense and distributed linearly along the rivers, obscuring water views of the rivers.

Intensive irrigated row crops and wildlife management areas are the primary land uses in the study area. Agricultural lands consist of expansive areas of uniform rows and plots, separated by berms and cement-lined canals. The vivid green crops contrast significantly with the earthen tones of the berms and other surrounding land features of the arid desert. The berms and canals create a uniform grid pattern over a majority of the land area.

Due to the large numbers and variety, birds are an important aesthetic/visual element at the Salton Sea. Many of the birds congregate at or near the Sonny Bono NWR and the Imperial Wildlife Area. The Sonny Bono NWR, shown on Figure 2-2, contains areas of salt and freshwater marsh, open water, exposed playa, pasture, and managed agricultural fields. Public access to the shoreline is provided at observation towers, viewing blinds, observation trails, and an interpretive center. Two separate units comprise the Sonny Bono NWR: Unit 1 encompasses the New River mouth and the shoreline to the south and west of the outlet; Unit 2 encompasses the Alamo River mouth and the shoreline to the south and west of the Alamo outlet. Rock Hill, a main topographic feature within the refuge, is located at the end of a 1-mile trail from the Sonny Bono NWR headquarters.

Red Hill Park is located immediately north of the second unit of the Sonny Bono NWR adjacent to the Alamo River mouth. Red Hill was originally an island connected to land by a causeway extending out from Garst Road; however, due to declining water levels, the areas between the island and mainland are exposed playa and salt flats that are no longer submerged beneath the Sea. The marina is located on the western side of the island and is no longer operational because of declining water levels. Fishermen launch their boats by trailering them to the water's edge. Remnants of two docks remain at the marina site. The site continues to support picnic facilities; however, they are no longer located along the shoreline of the Salton Sea. A campground, including recreational vehicle (RV) hookups and additional picnic facilities, is located on the northern and eastern sides of Red Hill Island (County of Imperial 2010). Two of the trailers/RVs parked in the campground currently are occupied by long-term residents rather than short-term visitors (personal communication, K. Mercurio 2011).

Rock Hill and Red Hill are both considered scenic "mountain peaks" because they are the only topographic features for miles around the Project vicinity. Previous studies in the area have considered the incorporation of one or both of these features in the design of restored habitat to significantly enhance the scenic quality of the area (Salton Sea Authority Outdoor Recreation Advisory Committee 2004).



Source: Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.1-1 Representative Photos of the Study Area (Photos 1-5)

Source: Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.1-2 Representative Photos of the Study Area (Photos 6-9)

Figure 3.1-3 Key Observation Points

Geothermal plants are visible in the southern parts of the study area and are dominant visual features due to their height and bulk. Steam plumes from the plants may be visible depending on atmospheric conditions, especially during cooler weather.

3.1.3.2 Visibility

Despite the Project area's general flat topography, visual access to the southern portion of the Salton Sea is limited due to the Salton Sea's distance from major highways (SR-86 and SR-111) and other urban centers. Within the study area, visual access is further limited by areas of dense riparian vegetation associated with the rivers and canals, as well as by the berms separating agricultural fields. In addition to limited visual access, physical access to the shoreline of the Salton Sea is generally restricted throughout most of the study area because of private land ownership and trespassing restrictions in protected areas. Visual access to the potential SCH Project sites at the Alamo River is provided Red Hill Park. Red Hill provides excellent views of the Salton Sea and surrounding areas.

3.1.3.3 Viewer Sensitivity

Viewer sensitivity is a measure of public concern for scenic quality and is analyzed by considering the type of users, amount of use, public interest, and adjacent land uses. Users within the study area include recreational users, such as hunters, anglers, and birdwatchers; farmworkers, and residents at nearby farms; employees at the geothermal plants; and commuters/travelers on SR-86 between the intersection of SR-78 and Vendel Road. Workers and commuters in the area would view the Salton Sea in the vicinity of the New River as a backdrop to their daily activities or as a brief view as they pass through the area. Worker and commuter views of the SCH ponds at both the New and Alamo river sites would generally be obstructed by industrial and farming uses, including geothermal plants; farm equipment; agricultural fields; and the expansive grid network of canals that covers most of the area. These users would likely be insensitive to changes in visual character because the Project area would not be the focus of their activities and because views of farming and industrial uses would dominate the foreground of their views.

Recreational users, such as hunters, photographers, and birdwatchers, participate in these activities at the Sonny Bono NWR, Imperial Wildlife Area, and other sites in the study area. Because the value of such recreational activities is enhanced by the scenic quality of the surrounding areas, these users would have a greater interest in the preservation or enhancement of the visual character of the proposed Project sites. Additionally, because many of these users partake in recreational activities within or directly adjacent to the Project sites, views are more focused on the natural environment and less obstructed by man-made modifications that would lessen their sensitivity to change.

3.1.3.4 Key Observation Points

KOPs are viewing locations chosen to be representative of the most visually sensitive areas that would view the Project sites. The inventory of KOPs includes three components: (1) identification and photo-documentation of viewing areas and potential KOPs, (2) classification of the visual sensitivity of the KOPs, and (3) description of the Project's visibility from the KOPs. KOPs were identified based on review of available land use data and field inspection.

Three sensitive viewing locations were identified as representative of viewers who would be most susceptible to visual impact within their viewshed as a result of the SCH Project. The selected KOPs are representative of the range of potential viewer experience from the immediate surrounding areas. KOPs are static depictions of the visual environment that is in reality experienced and perceived through dynamic interaction of the viewer and his/her environment. Therefore, the analysis of KOPs considers visual features in the context of the viewer's experience that may not be visible within the KOP image. These features contribute to the overall perception of landscape associated with the viewer's experience.

In addition, KOPs are analyzed as being representative of a larger area than the specific KOP location when that image is considered to be representative of the visual experience of viewers within a larger, but related, geographic area.

KOP locations are included for both the New and Alamo river sites. KOP locations and photographs are presented in Figure 3.1-3. A brief characterization of these areas is provided below.

KOP A

Travelers along SR-86 would have varying views of the Project due to distance from the site, topography, and built structures. KOP A is taken from SR-86 near the intersection with Poe Road, looking northeast towards the Salton Sea. SR-86 is one of the primary north-south routes through the Imperial Valley and is the only state highway that passes within viewing distance of the Project. For travelers along SR-86, the Salton Sea is visible in the distance, with foreground views being primarily of agricultural fields, canals and scattered farmhouses. SR-86 is primarily a four-lane, separated highway traveled by either local farmers or trucks traveling between the border crossing at Calexico and Interstate 10. Northbound and southbound annual average daily traffic in the portion of the highway that passes closest to the Project area is 10,800 trips per day and 8,700 trips per day, respectively.

KOP B

KOP B views the existing southern shoreline of the Salton Sea from the northern end of Bruchard Road. This viewpoint is located within the Sonny Bono NWR near the confluence of the New River and the Salton Sea. The view is of exposed playa, an agricultural drain, and riparian habitat bordering the New River in the foreground, and the Salton Sea and distant mountains in the background. The visual environment is generally composed of natural elements, except for a single road extending onto the exposed playa, which is minimally obtrusive and contrasts only slightly with the exposed playa. This view is representative of recreational users visiting Unit 1 of the NWR, including photographers and birders. Dense vegetation in the area associated with the New River and canals obstructs views from surrounding agricultural properties and local roads.

KOP C

The location of KOP C is representative of the viewer experience from the campground located at Red Hill Park. This viewpoint is located on the north shore of the island, looking north towards the Alamo River mouth. The view is dominated by exposed playa with a thin border of riparian vegetation lining the horizon. The dense vegetation and the angle of view obstruct any potential views of the Alamo River, which flows across the exposed playa to its outlet at the Salton Sea. Only two of the campers at the Red Hill campground are long-term seasonal residents. Overnight campers, while infrequent, would be expected to be sensitive to the visual environment as the focus of their visit would likely be to view the natural surroundings.

3.1.4 Impacts and Mitigation Measures

3.1.4.1 Impact Analysis Methodology

Effects on visual resource are created when the physical characteristics of facilities or alterations to the natural environment associated with a project contrast with natural and existing characteristics of the landscape setting. Factors that affect the degree to which a project affects visual resources include (1) scenic quality, (2) visibility, and (3) sensitivity of the viewers. Natural landscapes are traditionally considered to be more aesthetically pleasing and of greater scenic quality than man-made landscapes and are measured based on landforms, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modifications. Resources that are located closer to the viewer, or where there is no interruption of the view, are generally considered more valuable. Resources that are viewed by those who use an area

frequently, are subject to high levels of public interest, are adjacent to complementary land uses, or are considered special areas are also viewed as more important aesthetically.

Impacts of the Project alternatives are presented through a discussion of changes in views from the KOPs. Because the Project alternatives would involve construction at different locations, the KOPs that could be affected would vary depending on the location of the ponds and associated facilities. Alternatives 1, 2, and 3 would construct ponds near the New River, while Alternatives 4, 5, and 6 would construct ponds near the Alamo River. Due to this variation, the Project sites (and associated construction activities) for Alternatives 1, 2, and 3 could be visible from KOPs A and B, but would not be visible from KOP C. The Project sites for Alternatives 4, 5, and 6 (and associated construction activities) could be visible from KOP C, but would not be visible from either KOPs A or B.

3.1.4.2 Thresholds of Significance

Significance Criteria

Impacts on aesthetic resources would be significant if the Project alternatives would:

- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area;
- Substantially damage scenic resources, including but not limited to trees; rock outcroppings, and historic buildings within a state scenic highway; or
- Have a substantial adverse impact on a scenic vista.

Application of Significance Criteria

A summary of the overall methodology used in applying the significance criteria to the Project alternatives follows:

- **Substantially degrade visual character or quality** – The analysis is based upon changes to the scenic quality, visibility and sensitivity of viewers. It is assumed that the Project would generally produce beneficial changes to the visual environment of the Project area; however, during construction there is the potential for degradation of the visual character.
- **Substantially damage scenic resources including those within a state scenic highway** – The Project would be constructed as the Salton Sea recedes and would restore habitat that would be lost. It would not substantially damage scenic resources. No officially designated state scenic highways are present in Imperial County, nor are there any eligible state scenic highways within viewing distance of the Project area. Therefore, this criterion is not addressed in the following impact assessment[1].
- **Create a new source of light or glare** – Night lighting could be required during construction, so this impact is addressed below. Lighting at the trailer serving as an office for permanent employees would be minimal and would not cause an adverse change in the environment, and this impact is not discussed further. No substantial sources of glare would be introduced as part of the SCH Project, so this issue is not addressed further.

[11] Highways within Imperial County that are eligible for designation as a state scenic highway include Interstate 8 (I-8), State Route 78 (SR-78), and State Route 111 (SR-111). I-8 from the border with San Diego County to SR-98 near Coyote Wells; SR-78 west of the intersection with SR-86; and SR-111 from Bombay Beach north to the Riverside County line are eligible for scenic highway designation. However, Imperial County has not applied for scenic highway designation for these routes. Moreover, none of the routes listed as eligible is within viewing distance of the Project sites (California Department of Transportation 2009).

- **Have a substantial adverse impact on a scenic vista** – No scenic vistas are identified in the Imperial County General Plan or other applicable land use plans. Red Hill provides expansive views of the proposed Alamo River sites and surrounding areas. Therefore, vistas from this viewpoint may be considered scenic and are discussed in combination with impacts to visual character and quality.

3.1.4.3 No Action Alternative

The description of the impacts of the No Action Alternative that is included in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources [DWR] and California Department of Fish and Game [DFG] 2007) is applicable to the SCH Project and summarized below. This alternative would involve construction and operations and maintenance activities associated with pupfish channels and relocating recreational facilities as the Salton Sea recedes.

Under the No Action Alternative, views would be affected primarily by the pupfish channels and the receding Salton Sea. Pupfish channels would be unlined excavated channels along the southern shoreline and have the general appearance of a drainage canal. The pupfish channels would also be constructed by 2020. The Salton Sea would continue to appear as a large body of water. However, the Salton Sea would not be located adjacent to the shoreline. This high salinity water body probably would be reddish brown to dark brown based on water quality and weather conditions.

Additionally, the No Action Alternative would result in reduced habitat at the Salton Sea. Higher salinity levels would reduce survival rates of aquatic species, and in particular, fish that provide an important food source for birds. Fewer birds would reduce photography and birding opportunities and would reduce the aesthetic value of the area for recreational users. Therefore, impacts on wildlife would degrade the visual quality, character, and scenic vistas of the Project area.

3.1.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Alternative 1 would restore approximately 3,130 acres of habitat near the confluence of the New River and the Salton Sea. Restored habitat would include ponds surrounded by berms that would extend along the shoreline from Young Road in the northeast to the southwestern extent of the Sonny Bono NWR. The ponds would include nesting islands. An approximately 60-acre sedimentation basin would be constructed several miles upriver near the point of diversion from the New River. A brackish water supply pipeline would be constructed as well, and could follow existing roads or the river corridor or could cross agricultural fields. A seawater pump and associated pipeline would be required, as well.

Impact AES-1: Construction would temporarily degrade the scenic quality and character of the site and surrounding areas (less-than-significant impact). Construction of the SCH ponds and associated components would involve extensive excavation; the formation of berms and islands; and trenching for the brackish water supply pipeline. The brackish water pipeline corridor would be restored to its previous condition once construction was completed. Trucks and light vehicles would traverse nearby roads each day in order to transport workers and haul construction materials, but these would not cause a substantial visual change since trucks and heavy equipment are typically used in agricultural settings.

Representative views of the Project site during construction would include views from KOP A and KOP B. The Project site would not be visible from KOP C. Therefore, no impacts would occur at these locations.

KOP A would be representative of views from SR-86 and from agricultural fields to the south and west of the site. The Project site would be viewed from a distance (at least 2 miles from the nearest pond site) and views would be obscured or interrupted by other agricultural and industrial uses in the area. Heavy

machinery associated with construction activity would not be visible, although dust associated with trucks traveling to and from the site on dirt roads could be visible from these locations. Viewers from areas representative of KOP A would likely not be visiting the area for the aesthetic values it provides for activities such as photography and birding, but would rather be passing through or involved in agricultural or industrial activities. Any impacts would be temporary and less than significant when compared to both the existing environmental setting and the No Action Alternative.

KOP B is located within the Project site and is representative of views by visitors to the Sonny Bono NWR. During Project construction, views from this point would be dominated by heavy machinery engaged in ground disturbing construction activities and dust emissions. Individuals viewing the Project from this area would likely be sensitive to changes in the visual environment; however, access is limited in this area and construction would only occur temporarily. Therefore, impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Construction would likely disrupt normal wildlife patterns in the immediate vicinity, but this change would be temporary, and wildlife viewing opportunities would be available at the nearby Sonny Bono NWR and Imperial Wildlife Area. Therefore, impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact AES-2: The SCH ponds would enhance the scenic quality and character of the site and surrounding areas (beneficial impact). Once operational, views from KOP A of the Project site would likely be of the berms and dikes that contain the SCH ponds due to the angle of view from which travelers along SR-86 and nearby agricultural areas view the site. Because of the distance (over 2 miles from the nearest pond site), the Project site would likely be undistinguishable from the surrounding area. There would be little contrast between the Project and the adjacent agricultural areas and remaining open water of the Salton Sea. No impacts on the visual environment would occur when the Project was viewed from this distance.

The SCH ponds would be constructed in areas that are currently or were recently submerged. Upon completion of construction, the area viewed from KOP B would consist primarily of SCH ponds surrounded by berms. The ponds and nesting islands are considered a more aesthetically pleasing setting than the exposed playa that would be present when construction began. The SCH ponds are intended to provide habitat for birds, which also would contribute to the area's scenic qualities. The scenic quality and character of the site would be improved compared to both the existing conditions and the No Action Alternative, with greater benefit realized in comparison to No Action, because the amount of exposed playa would increase over time. Overall, impacts would be beneficial when compared to both the existing environmental setting and the No Action Alternative.

Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area (less-than-significant impact). Views from KOP B may include a trailer that would be present at the site for use by permanent employees. The trailer would be compatible with existing agricultural uses that predominate. The sedimentation basin that would be located near the New River would also be compatible with agricultural uses, and the brackish water pipeline corridor would be restored to its previous condition. The diversion structure would require the removal of a small amount of vegetation around the New River, but the disturbed area would be minor and would not be visible from sensitive viewpoints at the Sonny Bono NWR. The seawater pump station would be located on a platform in the Sea and may have to be relocated as the Sea recedes. A pipeline would be required to bring seawater to the ponds. Such small-scale facilities would be visually compatible with surrounding agricultural uses. Therefore, impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact AES-4: Some construction activities may occur at night, requiring lighting (less-than-significant impact). It is possible that some activities, such as dredging, may occur 24 hours a day and require night lighting. This impact would be temporary, and the site is located in a remote rural area, well-removed from populations who would be affected by the increased night lighting. Thus, this impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

3.1.4.5 Alternative 2 – New River, Pumped Diversion

The key differences between Alternative 2 and Alternative 1 are that less habitat would be restored (2,670 acres as opposed to 3,130 acres), no brackish water pipeline would be required to convey river water to the ponds, pumps would be used, the sedimentation basin would be located in the pond area, and the diversion would be close to the ponds. Additionally, the configuration of the pond sites would be different, with the ponds extending further west.

Impact AES-1: Construction would temporarily degrade the scenic quality and character of the site and surrounding areas (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although KOP A would be closer to the nearest pond (approximately 1 mile away), and no impacts from brackish water pipeline construction would occur. The impact conclusion is unchanged.

Impact AES-2: The SCH ponds would enhance the scenic quality and character of the site and surrounding areas (beneficial impact). The discussion under Alternative 1 is generally applicable to this alternative, although KOP A would be closer to the nearest pond (approximately 1 mile away). The impact conclusion is unchanged.

Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although no impacts from brackish water pipeline construction would occur. The sedimentation basin would be within the pond sites and would be visually compatible with the surrounding area. The minor amount of vegetation removal required for the diversion structure would be closer to the viewers from the Sonny Bono NWR, but it would be small and would not cause a substantial change in the visual environment. Pump facilities are typical of agricultural areas and would be compatible with surrounding uses.

Impact AES-4: Some construction activities may occur at night, requiring lighting (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.1.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

The key differences between Alternative 3 and Alternative 1 are that more habitat would be restored (3,770 acres as opposed to 3,130 acres), no brackish water pipeline would be required to convey river water to the ponds, pumps would be used, the sedimentation basin would be located in the pond area, and the diversion would be close to the ponds. Additionally, the configuration of the pond sites would be different, with the ponds extending further west.

Impact AES-1: Construction would temporarily degrade the scenic quality and character of the site and surrounding areas (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although KOP A would be closer to the nearest pond (approximately 1 mile away), and no impacts from brackish water pipeline construction would occur. The impact conclusion is unchanged.

Impact AES-2: The SCH ponds would enhance the scenic quality and character of the site and surrounding areas (beneficial impact). The discussion under Alternative 1 is generally applicable to this alternative, although KOP A would be closer to the nearest pond (approximately 1 mile away). The impact conclusion is unchanged.

Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although no impacts from brackish water pipeline construction would occur. The sedimentation basin would be within the pond sites and would be visually compatible with the surrounding area. The minor amount of vegetation removal required for the diversion structure would be closer to the viewers from the Sonny Bono NWR, but it would be small and would not cause a substantial change in the visual environment. Pump facilities are typical of agricultural areas and would be compatible with surrounding uses.

Impact AES-4: Some construction activities may occur at night, requiring lighting (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.1.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Alternative 4 would involve the restoration of less habitat than Alternative 1 (2,290 acres as opposed to 3,130 acres. Other Project elements would be similar. Viewers in areas represented by KOPs A and B would not have views of the Project sites or associated construction activities. Therefore, viewers near the New River mouth or Unit 1 of the Sonny Bono NWR would not experience any impacts related to construction of Alternative 4.

Impact AES-1: Construction would temporarily degrade the scenic quality and character of the site and surrounding areas (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Those at the nearby Red Hill Park (represented by KOP C) would be able to view construction, particularly at the higher elevations. However, visual impacts would be temporary and limited to those who are immediately adjacent to or within the Project site. Impacts would remain less than significant.

Impact AES-2: The SCH ponds would enhance the scenic quality and character of the site and surrounding areas (beneficial impact). The discussion under Alternative 1 is generally applicable to this alternative. Views would be enhanced for those visiting Red Hill Park, as well as for the few long-term residents at the park.

Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AES-4: Some construction activities may occur at night, requiring lighting (significant impact). As noted under Alternative 1, some construction may require the temporary use of night lighting. When construction occurred in the vicinity of Red Hill, this would result in a substantial change over the current conditions in this undeveloped rural area, and could pose an annoyance to those residing or camping there. This would be a significant impact when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM AES-1: Shield and direct construction lights away from Red Hill Park. To the extent feasible, when campers or other residents are present, nighttime construction should occur as far from the park as

possible. Additionally, lights should be shielded and directed away from the park and should be turned out when no longer needed.

Residual Impact

Implementation of MM AES-1 would reduce this impact to less than significant because lighting impacts on those staying at Red Hill Park would be minimized.

3.1.4.8 Alternative 5 – Alamo River, Pumped Diversion

Key differences between Alternatives 1 and 5 are that Alternative 5 would involve the restoration of less habitat (2,080 acres as opposed to 3,130 acres), no brackish water pipeline would be required to convey river water to the ponds, the sedimentation basin would be located in the pond area, and the diversion would be close to the ponds.

Impact AES-1: Construction would temporarily degrade the scenic quality and character of the site and surrounding areas (less-than-significant impact). The discussions under Alternatives 1 and 4 are generally applicable to this alternative, although no impacts from brackish water pipeline construction would occur.

Impact AES-2: The SCH ponds would enhance the scenic quality and character of the site and surrounding areas (beneficial impact). The discussion under Alternatives 1 and 4 is generally applicable to this alternative. Views would be enhanced for those visiting Red Hill Park, as well as for the few long-term residents.

Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although no impacts from brackish water pipeline construction would occur. The sedimentation basin would be within the pond sites and visually compatible with the surrounding area. The minor amount of vegetation removal required for the diversion structure would be closer to the viewers from the Sonny Bono NWR, but it would be small and would not cause a substantial change in the visual environment. Pump facilities are typical of agricultural areas and would be compatible with surrounding uses.

Impact AES-4: Some construction activities may occur at night, requiring lighting (significant impact). The discussion under Alternative 2 is applicable to this alternative. MM AES-1 also is applicable to this alternative and would reduce this impact to less than significant.

3.1.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Key differences between Alternatives 1 and 6 are that Alternative 6 would involve the restoration of less habitat (2,940 acres as opposed to 3,130 acres), no brackish water pipeline would be required to convey river water to the ponds, the sedimentation basin would be located in the pond area, and the diversion would be close to the ponds.

Impact AES-1: Construction would temporarily degrade the scenic quality and character of the site and surrounding areas (less-than-significant impact). The discussions under Alternatives 1 and 4 are generally applicable to this alternative, although no impacts from brackish water pipeline construction would occur.

Impact AES-2: The SCH ponds would enhance the scenic quality and character of the site and surrounding areas (beneficial impact). The discussion under Alternatives 1 and 4 is generally

applicable to this alternative. Views would be enhanced for those visiting Red Hill Park, as well as for the few long-term residents.

Impact AES-3: Other SCH facilities would be compatible with the existing character of the surrounding area (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although no impacts from brackish water pipeline construction would occur. The sedimentation basin would be within the pond sites and visually compatible with the surrounding area. The minor amount of vegetation removal required for the diversion structure would be closer to the viewers from the Sonny Bono NWR, but it would be small and would not cause a substantial change in the visual environment. Pump facilities are typical of agricultural areas and would be compatible with surrounding uses.

Impact AES-4: Some construction activities may occur at night, requiring lighting (significant impact). The discussion under Alternative 2 is applicable to this alternative. MM AES-1 also is applicable to this alternative and would reduce this impact to less than significant.

3.1.5 References

California Department of Transportation. 2009. *Eligible and officially designated routes*. Website (http://www.dot.ca.gov/hq/LandArch/scenic/cahisys.htm) accessed on October 13, 2010.

California Department of Water Resources and California Department of Fish and Game 2007. Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report.

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County of Imperial. 2010. *Regional parks: Red Hill Marina Park*. Website (http://www.icpds.com/?pid=1083) accessed October 15, 2010.

Salton Sea Authority Outdoor Recreation Advisory Committee. 2004. Report to the Salton Sea Authority Board. June 24.

3.1.6 Personal Communications

Mercurio, Kira. 2011. Accountant, Imperial County Planning & Development Services. Personal communication with Sarah Bumby, Cardno ENTRIX. May 31.

3.2 AGRICULTURAL RESOURCES

3.2.1 Introduction

This section addresses the potential for the Species Conservation Habitat (SCH) Project to result in the temporary and permanent conversion of agricultural land (also referred to as Important Farmland, or Farmland) to nonagricultural use; conflict with existing zoning for agricultural use or a Williamson Act contract; or result in other changes that could lead to the conversion of agricultural land to nonagricultural use.

The Federal Farmland Protection Policy Act (7 USC section 4201 et seq.) defines Farmland as Prime Farmland, Unique Farmland, and Farmland of Statewide or Local Importance. Farmland subject to the Act's requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land. The California Environmental Quality Act (CEQA) (Public Resources Code section 21060.1) defines agricultural land as Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, as defined by the United States Department of Agriculture land inventory and monitoring criteria, as modified for California. The CEQA Guidelines, Appendix G, refer to such lands as Farmland. The California Department of Conservation (DOC) refers to these types of lands as Important Farmland, the definitions of which are provided later in this section. For purposes of this analysis, the terms agricultural land, Important Farmland, and Farmland are used interchangeably and refer to Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, as defined by the DOC.

The study area for agricultural resources is the area within the footprint of and adjacent to the SCH facilities, including the pond sites, diversion and conveyance structures, and sedimentation basins (when applicable). Potential economic impacts from bird intrusions on crops and disruptions of canals and drains are addressed in Section 3.19, Socioeconomics, as are the economic impacts associated with the inability to reclaim Farmland that is currently inundated by the Salton Sea resulting from pond creation. Impacts associated with the temporary and permanent easements that would be required for pipeline installation and maintenance also are addressed in Section 3.19.

Table 3.2-1 summarizes the impacts of the six Project alternatives on agricultural resources, compared to both the existing conditions and the No Action Alternative.

Table 3.2-1 Summary of Impacts on Agricultural Resources

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact AG-1: Construction of the diversion and conveyance facilities and brackish water pipeline maintenance would temporarily disrupt agricultural production but would not permanently convert Farmland to nonagricultural use.	Existing Condition	L	O	O	L	O	O	None required
	No Action	L	O	O	L	O	O	None required
Impact AG-2: Construction of the sedimentation basin would result in the permanent conversion of a small amount of Farmland to nonagricultural use.	Existing Condition	L	O	O	L	O	O	None required
	No Action	L	O	O	L	O	O	None required

Table 3.2-1 Summary of Impacts on Agricultural Resources								
Impact AG-3: Construction of the sedimentation basin potentially would result in the permanent conversion of Williamson Act contract land to nonagricultural use.	Existing Condition	S	O	O	S	O	O	MM AG-1: Avoidance of Williamson Act land or payment of Williamson Act cancellation fees.
	No Action	S	O	O	S	O	O	Same as Existing Condition
Note: O = No Impact L = Less-than-Significant Impact S = Significant Impact, but Mitigable to Less than Significant U = Significant Unavoidable Impact B = Beneficial Impact								

3.2.2 Regulatory Requirements

3.2.2.1 Federal Requirements

The United States Department of Agriculture's Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service, intended to produce agricultural resource maps based on soil quality and land use across the nation. As part of this nationwide agricultural land use mapping effort, the NRCS developed a series of definitions for its Land Inventory and Monitoring criteria program. These criteria classified the land's suitability for agriculture production, and the suitability included both the physical and chemical characteristics of soils, as well as specified land use characteristics. Based on the Land Inventory and Monitoring criteria, the NRCS intended to complete a nationwide set of Important Farmland maps; however, due to decreasing Federal priorities, the program and mapping were never completed. Since 1980, the state of California has assisted the NRCS with the completion of mapping in the state. As explained further below, in 1982, the state of California established the Farmland Mapping and Monitoring Program (FMMP) within the DOC to carry on the mapping activity on a continuing basis, and with a greater level of detail.

The Federal Farmland Protection Policy Act (7 USC section 4201 et seq.) applies to projects that are sponsored or financed in whole or in part by the Federal government. The Act does not apply to projects subject to Federal permitting. As a result, the Project is not subject to the Act because it is neither a Federal agency-sponsored project, nor is it funded by the Federal government.

3.2.2.2 State Requirements

California Conservation Act of 1965 (Williamson Act) and Assembly Bill 2530

Commonly referred to as the Williamson Act, the California Land Conservation Act of 1965 (Government Code sections 51200–51297.4) enables local governments to enter into contracts with private landowners that restrict specific parcels of land to agricultural or related open space use. In return, these landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses rather than the property’s full market value. Local governments receive an annual subvention of forgone property tax revenues from the State of California via the Open Space Subvention Act of 1971 (Government Code sections 16140–16154). The act establishes principles of compatibility for uses allowed on lands under contract. Generally, uses are compatible if they will not significantly compromise the long-term productive agricultural capability, displace or impair current or

reasonably foreseeable agricultural operations, or result in removal of adjacent contracted land from agricultural open space uses. Property tax assessments of lands under Williamson Act contracts are based on generated income of land as opposed to the potential market value of the property (DOC 2010a). Due to the current state budget crisis, the state suspended its subvention program in 2010 and did not reimburse counties for the money they lost from the property tax breaks for Williamson Act contract holders.

Imperial County supervisors voted in February 2010 not to renew Williamson Act contracts when they are next up for renewal, on January 1, 2011, and not to accept new contracts. This means that lands currently under Williamson Act contracts have begun the nonrenewal process, and will lose their Williamson Act status by January 1, 2021. Any cancellation of Williamson Act contract lands prior to the nonrenewal termination date would require payment of cancellation fees (personal communication, A. Havens 2011).

3.2.2.3 Important Farmlands Inventory

The DOC's FMMP is a state program that produces maps and statistical data used for analyzing impacts on California’s agricultural resources. The goal of the FMMP is to provide consistent, timely, and accurate data, including maps and statistical data, in order to assist decision makers in making informed decisions regarding the utilization of California farmland.

Using data from the NRCS, the FMMP produces maps and statistical data used for analyzing impacts on California's agricultural resources. The maps, called Important Farmland Maps, are updated every 2 years with the use of aerial photo interpretation, a computer mapping system, field reconnaissance, and public review. The FMMP identifies seven categories of land: Prime Farmland; Farmland of Statewide Importance; Unique Farmland; Farmland of Local Importance; Grazing Land; Urban and Built-up Land; and Other Land. The definitions for these agricultural land categories were developed by the NRCS as part of the nationwide Land Inventory and Monitoring criteria. The definitions have been modified for use in California. The most significant modification is that Prime Farmland and Farmland of Statewide Importance must be irrigated land. The mapping of Grazing Land as part of the Important Farmland Maps is also unique to California. The minimum mapping unit is 10 acres, unless otherwise specified. Units of land smaller than 10 acres are incorporated into the surrounding map classifications. Each category of farmland is summarized below (DOC 2010b).

Prime Farmland (P). Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.

Farmland of Statewide Importance (S). Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.

Unique Farmland (U). Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the 4 years prior to the mapping date.

Farmland of Local Importance (L). Land of importance to the local agricultural economy, as determined by each county's board of supervisors and a local advisory committee. Los Angeles County

has determined that Farmland of Local Importance is land that would meet the standard criteria for Prime Farmland or Farmland of Statewide Importance, but is not irrigated.

Grazing Land (G). Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, the University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.

Urban and Built-up Land (D). Land occupied by structures with a building density of at least one unit to every 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

Other Land (X). Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

3.2.2.4 Local Requirements

Imperial County General Plan

The Agricultural Element of the Imperial County General Plan (County of Imperial 1996) serves as the primary policy statement by the Board of Supervisors for implementing development policies for agricultural land use in the county. It includes a number of goals and objectives associated with the preservation of agricultural land and maximizing agricultural productivity.

Imperial County Right-to-Farm Ordinance

The Imperial County Board of Supervisors recognized the potential threats to agricultural productivity posed by increasing nonagricultural land uses and approved the Right-to-Farm Ordinance on August 7, 1990. The ordinance permits operation of properly conducted agricultural operations within the county and is intended to reduce the loss of agricultural resources in the county and promote a good neighbor policy by advising purchasers and users of adjacent properties about the potential problems and inconveniences associated with agricultural operations. The ordinance also established an Agricultural Grievance Committee to settle disputes between agriculturalists and adjacent property owners (County of Imperial 1996).

3.2.3 Affected Environment

Imperial County covers an area of 4,597 square miles, or 2,942,080 acres. Approximately 20 percent of the land is irrigated for agricultural purposes, most notably the central area known as Imperial Valley. With over 5,000,000 acres of harvested commodities, agriculture remains one of the most valuable industries in Imperial County. Cattle are the county’s top commodity, followed by head and leaf lettuce, wheat, and alfalfa. Other important crops include broccoli, carrots, onions, sugar beets, and spring mix (County of Imperial Agricultural Commissioner 2010). As shown in Table 3.19-4 in Section 3.19, Socioeconomics, the relative importance of individual crops may change over time, although cattle are consistently the top commodity.

Colorado River water is used to irrigate crops and is provided by the Imperial Irrigation District (IID). Water availability plays a critical role for agricultural resources in Imperial County. Irrigation allows farmers to use highly productive soils that might otherwise lay fallow. Although some crops are affected by salinity, extreme temperatures, and other environmental factors, the existing water delivery system overcomes the lack of precipitation in this otherwise arid region as a significant limiting factor to intensive crop production (County of Imperial 1996).

3.2.3.1 Designated Farmland at the Proposed SCH Sites near the New River

The DOC has delineated Important Farmland within the study area, and based on that data, the proposed pond sites are in areas that were recently or are currently inundated by the Salton Sea and as such are not Farmland. The area where water diversion and water conveyance facilities and the sedimentation basin could be located comprises approximately 4,620 acres. Of those acres, approximately 4,275 (about 93 percent) are either Prime Farmland or Farmland of Statewide Importance. In addition, 1,990 acres are under current Williamson Act contracts. Table 3.2-2 shows the various Farmland categories present in the area. Figure 3.2-1 illustrates the distribution of Farmland around the New River within the study area.

Table 3.2-2 New River Farmland Categories

Prime Farmland (acres)	Unique Farmland (acres)	Farmland of Statewide Importance (acres)	Williamson Act Contract lands (acres)
1,794	N/A	2,480	1,990

Note: acreages are approximate.
N/A – No Farmland of this category in the Project vicinity
Source: DOC, FMMP, Imperial County, 2008

3.2.3.2 Designated Farmland at the Proposed SCH Sites near the Alamo River

The DOC has delineated Important Farmland within the study area, and based on that data, the proposed pond sites are in areas that were recently or are currently inundated by the Salton Sea and as such are not Farmland. The area where water diversion and water conveyance facilities and the sedimentation basin could be located comprises approximately 6,500 acres. Of those acres, approximately 4,325 (about 67 percent) are either Prime Farmland or Farmland of Statewide Importance. In addition, 1,137 acres are under current Williamson Act contracts. Table 3.2-3 shows the various Farmland categories. Figure 3.2-2 illustrates the distribution of Farmland around the Alamo River within the study area.

Table 3.2-3 Alamo River Farmland Categories

Prime Farmland (acres)	Unique Farmland (acres)	Farmland of Statewide Importance (acres)	Williamson Act Contract lands (acres)
1,019	N/A	3,306	1,137

Note: acreages are approximate.
N/A – No Farmland of this category in the Project vicinity
Source: DOC, FMMP, Imperial County, 2008

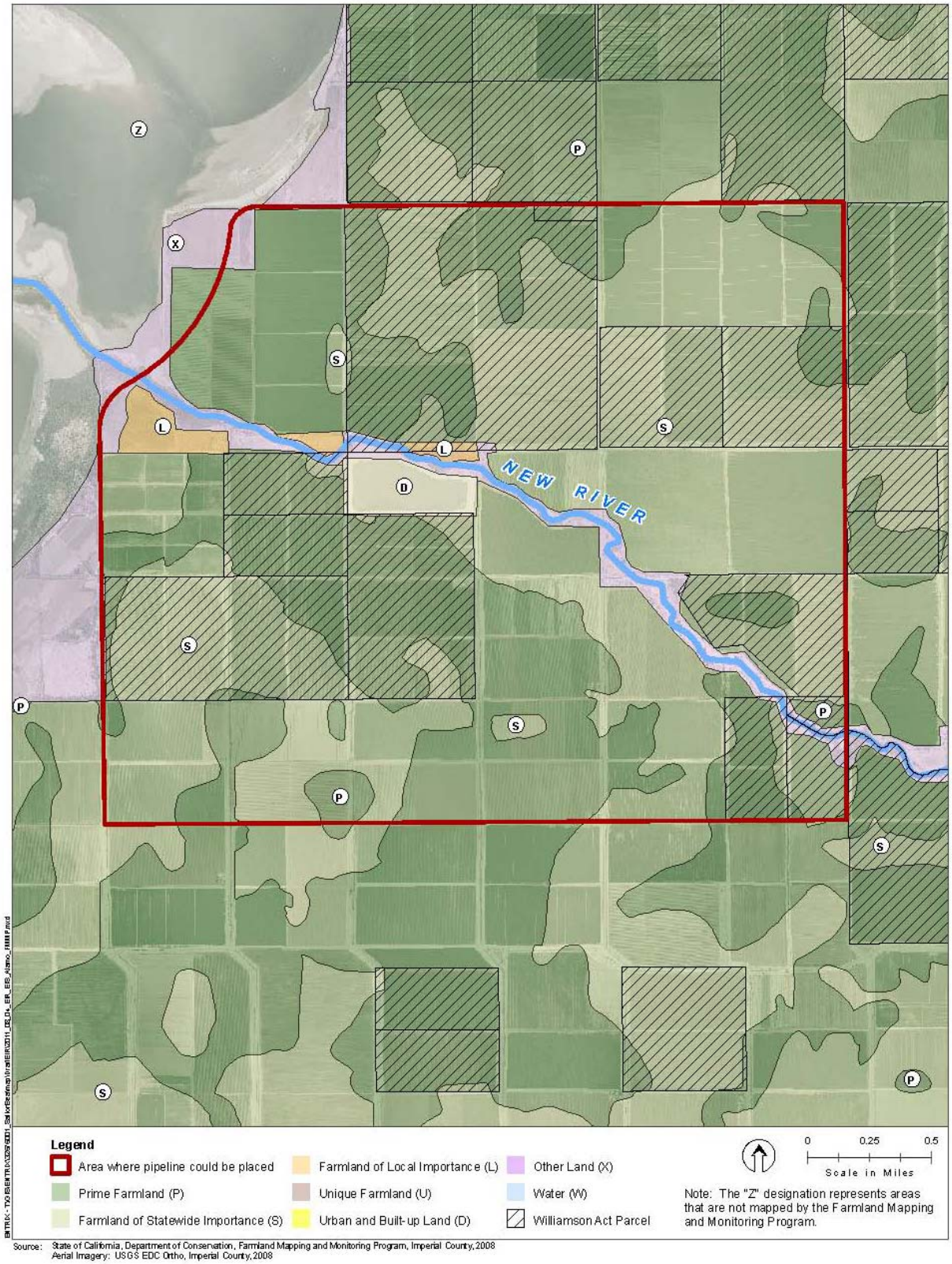

Figure 3.2-1 Farmland Classifications near the New River

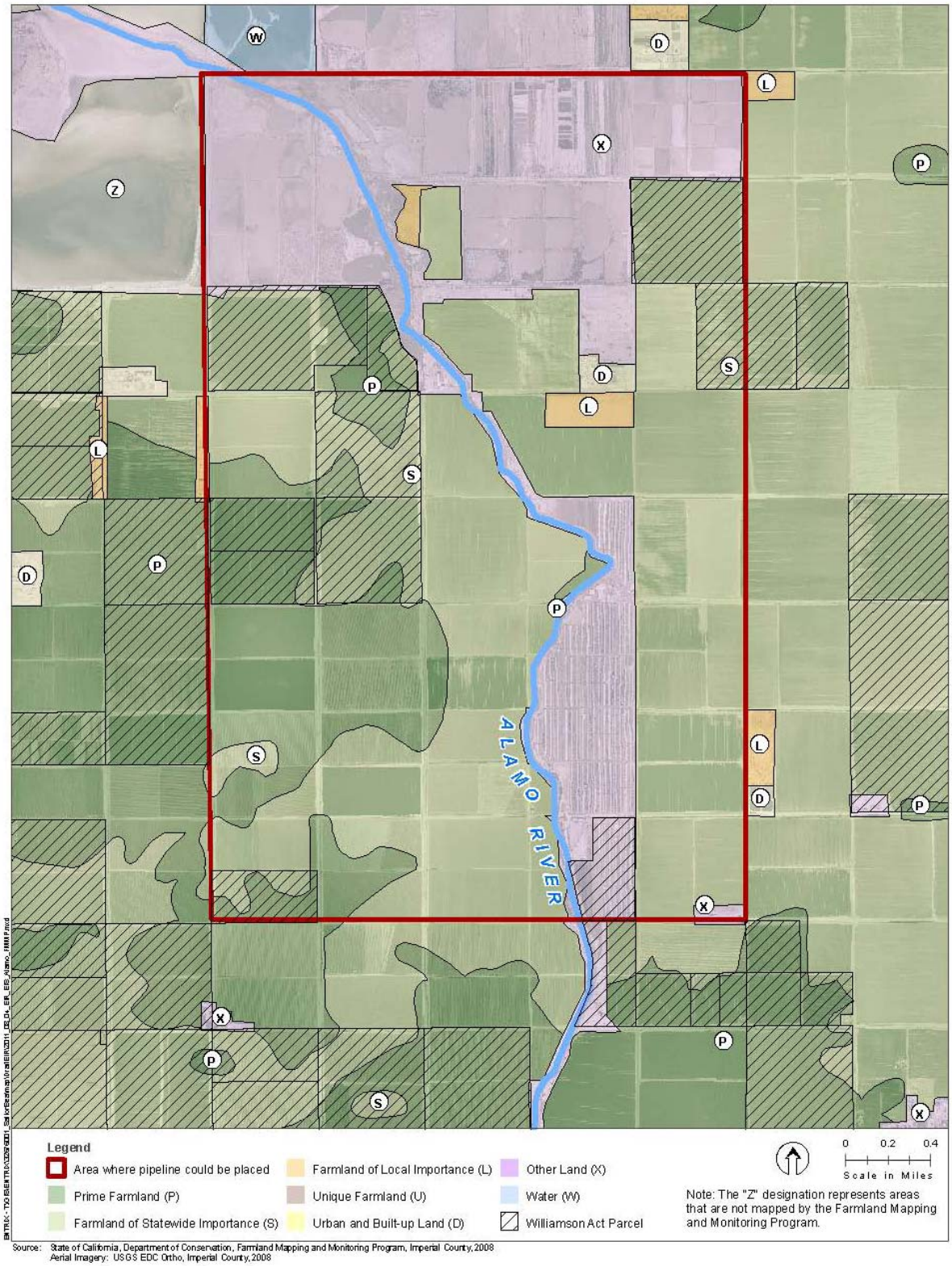

Figure 3.2-2 Farmland Classifications near the Alamo River

3.2.4 Impacts and Mitigation Measures

3.2.4.1 Impact Analysis Methodology

The analysis addresses the potential for the SCH Project to temporarily or permanently convert Farmland to nonagricultural use or conflict with agricultural zoning or a Williamson Act contract.

3.2.4.2 Thresholds of Significance

Significance Criteria

Impacts on agricultural resources would be significant if the Project alternatives would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the FMMP, to nonagricultural use;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));
- Result in the loss of forest land or conversion of forest land to nonforest use; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forest land to nonforest use.

Application of Significance Criteria

The SCH ponds would not be located on Farmland; therefore, no direct impacts on Farmland, agricultural zoning, or Williamson Act contracts would result from their construction, and such impacts are not considered further. The potential for construction of the water diversion and conveyance facilities and sedimentation basin to result in the conversion of Important Farmland to nonagricultural use is considered, however, along with potential conflicts with Williamson Act contracts. Conflicts with agricultural zoning are not addressed further because the ponds would not be located in areas zoned for agricultural use, and water pipelines would be an allowed use as would ancillary facilities such as the sedimentation basin. The Project would not use Colorado River Project as a water supply and would not otherwise affect the availability of water supplies for agricultural uses other than a brief disruption of canals and drains during construction, for which the landowner would be compensated. No other aspects of the Project would result in the conversion of Important Farmland to nonagricultural use. No forest land or timberland resources are in the Project vicinity. Therefore, significance criteria pertaining to these resources are not addressed in this section.

3.2.4.3 No Action Alternative

As described in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources and California Department of Fish and Game 2007), construction of facilities such as desert pupfish channels would be required, as would the relocation of recreational facilities as the Salton Sea recedes. This construction would be located within the Salton Sea bed and would not affect agricultural land. By 2078, the water surface elevation of the Salton Sea would decline to -248 feet mean sea level under the No Action Alternative. The reduction in water surface elevation under this alternative potentially would allow for the reclamation of currently inundated lands for agricultural use.

3.2.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact AG-1: Construction of the diversion and conveyance facilities and brackish water pipeline maintenance would temporarily disrupt agricultural production but would not permanently convert Farmland to nonagricultural use (less-than-significant impact). Construction would require a 220-foot right-of-way during brackish water pipeline installation, and a right-of-way also would be needed during operations to allow access for maintenance, although the corridor may be smaller. This impact would occur regardless of whether the brackish water pipeline followed an existing roadway or crossed agricultural fields, although it would be somewhat less if the roads were followed. The land right-of-way would be obtained from a willing owner who would be compensated for the temporary loss of the use of this land. Once the brackish water pipeline was installed, crops could be grown in the right-of-way. Temporary disruptions in agricultural uses could occur if the brackish water pipeline needed to be maintained, but crops could be grown again once maintenance was completed. Canals and drains would be temporarily diverted during construction, and potentially during maintenance, but they would be restored once construction was completed. Impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative because disturbed areas would be restored to their previous condition once construction and maintenance activities were completed, and agricultural practices would be able to resume at that time. Thus, Farmland would not be converted to nonagricultural use.

Impact AG-2: Construction of the sedimentation basin would result in the permanent conversion of a small amount of Farmland to nonagricultural use (less-than-significant impact). The sedimentation basin would be located on Farmland adjacent to the New River, which would require the permanent loss of approximately 60 acres. This amount would be negligible when compared to the more than 5,000,000 acres in production in Imperial County and well within the range of variability of the amount of agricultural land fallowed each year. The amount of land that was fallowed in the IID service area between 2002 and 2009 ranged from over 23,000 acres in 2002 to over 49,000 acres in 2007 (Table 3.2-4); the amount of fallowed land increased during this period due in part to water conservation measures required as a result of the Quantification Settlement Agreement, and it also fluctuates annually. Sixty acres represents only 0.0014 percent of the average acreage of land fallowed between 2004, when the IID fallowing program began, and 2009. It also is well under the annual variation in the amount of land that is fallowed (e.g., the amount of fallowed land increased by 1,761 acres between 2006 and 2007, whereas the acreage decreased by 6,198 between 2007 and 2008). This impact would be less than significant when compared to both the existing environmental setting and No Action Alternative given the small area affected in relation to the total area in production and the amount of land fallowed each year.

Table 3.2-4 Fallowed Land in the IID Service Area, 2002-2009

	2002	2003	2004	2005	2006	2007	2008	2009
IID Fallowing Program	—	—	11,827	11,891	14,830	17,078	14,476	15,317
Other Fallowed Land	23,341	25,251	27,912	30,299	32,608	32,121	28,525	26,428
Total	23,341	25,251	39,739	42,190	47,438	49,199	43,001	41,745

Source: IID 2010

Impact AG-3: Construction of the sedimentation basin potentially would result in the permanent conversion of Williamson Act contract land to nonagricultural use (significant impact). Depending on where the sedimentation basin is sited, the Project could permanently convert approximately 60 acres of Williamson Act land to nonagricultural use. The Williamson Act provides financial incentives to encourage the retention of agricultural land. As discussed under Impact AG-2, the conversion of 60 acres of agricultural land would negligible in relation to the amount of land that is currently farmed and fallowed in the Imperial Valley. However, the conversion of land under Williamson Act contracts prior to the nonrenewal termination date would require the payment of cancellation fees (personal communication, A. Havens 2011). This impact would be significant when compared to both the existing environmental setting and No Action Alternative.

Mitigation Measures

MM AG-1: Avoidance of Williamson Act land or payment of Williamson Act cancellation fees. If feasible, the sedimentation basin should not be located on land that is still under Williamson Act contracts. If this is not feasible, the California Natural Resources Agency will pay appropriate cancellation fees to the County of Imperial prior to Project completion.

Residual Impacts

Implementation of MM AG-1 would reduce impacts on Williamson Act contract lands to a less-than-significant level because appropriate compensation would be paid to Imperial County.

3.2.4.5 Alternative 2 – New River, Pumped Diversion

Alternative 2 would not require construction of a brackish water pipeline or diversion structure, and all facilities, including the sedimentation basin, would be constructed on land that was recently or is currently submerged. No impacts on Farmland would occur when compared to both the existing environmental setting and No Action Alternative, nor would conflicts with agricultural zoning or Williamson Act contracts.

3.2.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Alternative 3 would not require construction of a brackish water pipeline or diversion structure, and all facilities, including the sedimentation basin, would be constructed on land that was recently or is currently submerged. No impacts on Farmland would occur when compared to both the existing environmental setting and No Action Alternative, nor would conflicts with agricultural zoning or Williamson Act contracts.

3.2.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact AG-1: Construction of the diversion and conveyance facilities and brackish water pipeline maintenance would temporarily disrupt agricultural production but would not permanently convert Farmland to nonagricultural use (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AG-2: Construction of the sedimentation basin would result in the permanent conversion of a small amount of Farmland to nonagricultural use (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although only approximately 37 acres would be required for the sedimentation basin.

Impact AG-3: Construction of the sedimentation basin potentially would result in the permanent conversion of Williamson Act contract land to nonagricultural use (significant impact). The

discussion under Alternative 1 is applicable to this alternative, although only approximately 37 acres would be required for the sedimentation basin. MM AG-1 also is applicable to this alternative and would reduce the impact on Williamson Act lands to less than significant.

3.2.4.8 Alternative 5 – Alamo River, Pumped Diversion

Alternative 5 would not require construction of a brackish water pipeline or diversion structure, and all facilities, including the sedimentation basin, would be constructed on land that was recently or is currently submerged. No impacts on Farmland would occur, nor would conflicts with agricultural zoning or Williamson Act contracts.

3.2.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Alternative 6 would not require construction of a brackish water pipeline or diversion structure, and all facilities, including the sedimentation basin, would be constructed on land that was recently or is currently submerged. No impacts on Farmland would occur, nor would conflicts with agricultural zoning or Williamson Act contracts.

3.2.5 References

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County of Imperial. 1996. Imperial County General Plan: Agricultural element. Website (http://www.icpds.com/?pid=571).

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Imperial Irrigation District (IID). 2010. *Annual inventory of areas receiving water, 2002 to 2004, 2004 to 2006, and 2007 to 2009*. Website (http://www.iid.com/index.aspx?page=119) accessed April 7, 2010.

3.2.6 Personal Communications

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3.3 AIR QUALITY

3.3.1 Introduction

This section focuses on the potential for the Species Conservation Habitat Project (SCH Project or Project) to conflict with or obstruct an applicable air quality attainment plan, violate air quality standards, increase criteria pollutants for which the region is in nonattainment, expose sensitive receptors to substantial pollutant concentrations, and modify the existing microclimate next to the Salton Sea. It also addresses the need for a General Conformity Determination because of the Federal involvement. Greenhouse gas emissions are analyzed in Section 3.9, Greenhouse Gas Emissions/Climate Change. The potential for impacts from exposure to pesticides contained in the sediments disturbed during construction is addressed in Section 3.10, Hazards and Hazardous Materials.

The study area includes the Salton Sea Air Basin (Basin). Imperial County Air Pollution Control District (ICAPCD) and South Coast Air Quality Management District (SCAQMD) have jurisdiction over the Basin's southern and northern portions, respectively. SCAQMD oversees the northern Basin's Riverside County and Coachella Valley portions. ICAPCD oversees Calexico, Imperial County, and the Imperial Valley in the southeastern Basin, which is where the Project would be located. Thus, the Project falls exclusively under ICAPCD's jurisdiction.

Table 3.3-1 summarizes the impacts of the six Project alternatives on air quality, compared to both the existing conditions and the No Action Alternative.

Table 3.3-1 Summary of Impacts on Air Quality

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact AQ-1: Emissions from Project construction and maintenance are accounted for in applicable air quality plans and would not conflict with or obstruct their implementation.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AQ-2: The SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact AQ-3a: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X and PM_{10} thresholds during construction (applies to Alternatives 1, 2, and 3).	Existing Condition	U	U	U	—	—	—	MM AQ-1: Implement fugitive PM_{10} control measures. MM AQ-2: Implement diesel control measures.
	No Action	U	U	U	—	—	—	Same as Existing Condition
Impact AQ-3b: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X thresholds during construction (applies to Alternatives 4, 5, and 6).	Existing Condition				U	U	U	MM AQ-1: Implement fugitive PM_{10} control measures. MM AQ-2: Implement diesel control measures.

Table 3.3-1 Summary of Impacts on Air Quality

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
	No Action				U	U	U	Same as Existing Condition
Impact AQ-4: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards during operations but would not exceed any regulatory thresholds.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AQ-5: Project construction would result in a cumulatively considerable/significant net increase in emissions.	Existing Condition	U	U	U	U	U	U	MM AQ-1: Implement fugitive PM_{10} control measures. MM AQ-2: Implement diesel control measures.
	No Action	U	U	U	U	U	U	Same as Existing Condition
Impact AQ-6: Project emissions from construction and maintenance would not expose sensitive receptors to substantial pollutant concentrations.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AQ-7: The Project could result in localized odors during construction, operations, and maintenance.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact AQ-8: The Project would have a minor effect on the microclimate near the Salton Sea.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.3.2 Regulatory Setting

During construction, the Project would temporarily cause criteria emissions from the combustion of fossil fuels (i.e., diesel, gasoline) used to run construction equipment and vehicles, both on and off site. Construction activities would also cause emissions of fugitive dust, primarily as PM_{10}. During operation, the Project would result in emissions from on-road and off-road mobile sources used to achieve the habitat conservation goals. No stationary sources would be associated with Project operation. Therefore, regulations associated with stationary sources are not addressed.

3.3.2.1 Federal and State Air Quality Standards

The Clean Air Act of 1970 (CAA, amended 1977 and 1990, 42 United States Code [USC] section 7401 et seq.) established National Ambient Air Quality Standards (NAAQS), and individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when Federal standards were established, and because of the unique meteorological problems in the state, diversity between the Federal and the state standards currently in effect in California is considerable, as shown in Table 3.3-2 below. California Ambient Air Quality Standards (CAAQS) are at least as protective as national standards (as required by Federal law) and are often more stringent.

The ambient air quality standards shown in Table 3.3-2 are intended to protect the public health and welfare and specify the concentration of pollutants (with an adequate margin of safety) to which the public may be exposed without adverse health effects. The standards are designed to protect those segments of the public most susceptible to respiratory distress (known as sensitive receptors), including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

Table 3.3-2 Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		National Standards	
		ppmv	µg/m³	ppmv	µg/m³
Ozone (O_3)	1-hour	0.09	177	--	--
	8-hour	0.07	137	0.075	147
Nitrogen Dioxide (NO_2)	1-hour	0.18	338	0.100	188
	Annual	0.03	56	0.053	100
Sulfur Dioxide (SO_2)	1-hour	0.25	655	0.075	196
	3-hour (secondary)	--	--	0.50	1,309
	24-hour	0.04	105	--	--
	Annual	--	--	0.03	79
Carbon Monoxide (CO)	1-hour	20	22,898	35	40,071
	8-hour	9	10,304	9	10,304
	Lake Tahoe (8-hr)	6	6,869	--	--
Particulates (as PM_{10})	24-hour	--	50	--	150
	Annual	--	20	--	--
Particulates (as $PM_{2.5}$)	24-hour	--	--	--	35
	Annual	--	12	--	15
Lead (Pb)	30-day	--	1.5	--	--
	3-month (rolling)*	--	--	--	0.15
Sulfates (as SO_4)	24-hour	--	25	--	--
Hydrogen Sulfide (H_2S)	1-hour	0.03	42	--	--

Table 3.3-2 Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		National Standards	
		ppmv	µg/m³	ppmv	µg/m³
Vinyl Chloride (C_2H_3Cl)	24-hour	0.01	26	--	--
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per kilometer; visibility of 10 miles or more (0.07 to 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.		--	--

Sources: CARB 2010f; USEPA 2010

Notes:

ppmv = part(s) per million by volume

µg/m³ = microgram(s) per cubic meter

* The 1.5 µg/m³ Federal quarterly lead standard applied until 2008; 0.15 µg/m³ rolling 3-month average thereafter

For gases, µg/m³ calculated from ppmv based on molecular weight and standard conditions

Standard temperature 25 degrees Celsius

Standard molar volume 24.465 liter/g-mole

3.3.2.2 Federal Regulations

National Ambient Air Quality Standards

The Federal CAA and Clean Air Act Amendments (CAAA) regulations (42 USC section 7401 et seq., as amended in 1977 and 1990, and 40 Code of Federal Regulations [CFR] parts 50 through 99) serve as the basis for regulating air pollution in the United States. Pursuant to the Federal CAA of 1970, the United States Environmental Protection Agency (USEPA) established the NAAQS. The NAAQS were established for six major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the Federal and state governments have established ambient air quality standards for outdoor concentrations to protect public health. The NAAQS are two tiered: primary, to protect public health; and secondary, to prevent degradation of the environment (e.g., impairment of visibility, damage to vegetation and property, etc.).

The six Federal criteria pollutants are ozone (O_3), carbon monoxide (CO), particulate matter (which includes both PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). The Federal primary standards for these criteria pollutants, as well as the California standards for criteria pollutants, are shown in Table 3.3-2. USEPA uses ambient air data collected at permanent monitoring stations to classify regions as "attainment" or "nonattainment" depending on whether the regions meet the requirements stated in the primary NAAQS. Additional restrictions as required by USEPA are imposed on nonattainment areas in an effort to reach attainment.

The CAAA of 1990 identifies specific emission reduction goals and requires states with nonattainment areas to achieve the NAAQS by developing a State Implementation Plan (SIP). USEPA must approve the SIP and the SIP serves as the state's commitment to actions that will reduce or eliminate air quality

problems. An important aspect of the SIP is to designate a planning organization that will promulgate rules and implement strategies to achieve the NAAQS.

General Conformity Rule

Section 176(c)(1) of the CAAA (42 USC section 7506(c)) is known as the General Conformity Rule. It prohibits the Federal government from "engag[ing] in, support[ing] in any way, or provid[ing] financial assistance for, licens[ing] or permit[ing] or approv[ing] any activity" that does not conform to a SIP approved by the USEPA. The conformity rule was designed to ensure that Federal actions do not impede local efforts to control air pollution and requires Federal agencies to demonstrate that their actions "conform with" (i.e., do not undermine) the approved SIP for the subject geographic area. The first step in determining whether conformity review is required is to assess whether the Federal action would take place in a Federal nonattainment or maintenance area; i.e., an area that does not meet the NAAQS. If the action would occur in such an area, then it is necessary to determine whether the action would result in the emission of an air pollutant that is regulated due to the nonattainment or maintenance status of the region. If so, the Federal action may nonetheless be exempt.[1] If the action is not exempt, then one must determine whether the emissions from the action would exceed threshold levels. If threshold levels would be met or exceeded, then a conformity review is required (40 CFR section 93.153(b)).

As discussed in Section 3.3.4.5, Attainment Status Designations, Imperial County is designated moderate nonattainment for the Federal 8-hour O_3 NAAQS, while the Imperial Valley (which is the Salton Sea Air Basin's Imperial County portion) is designated as serious nonattainment area for 24-hour Federal PM_{10} and $PM_{2.5}$. The entire County is designated as a state nonattainment area for O_3 and PM_{10}.

3.3.2.3 State Regulations

Pursuant to the Federal CAA, states have the right to establish and enforce their own air quality standards; state standards may be equal to or more stringent, but not less stringent than Federal standards. In 1988, the state legislature passed the California Clean Air Act (CCAA) (California Health and Safety Code section 39600 et seq.), which, like its Federal counterpart, called for designations of areas as attainment or nonattainment based on state rather than Federal standards.

Similar to the Federal CAA, the CCAA also classifies areas according to pollution levels. Under the CCAA, and as discussed previously, Imperial County is designated nonattainment for the state 8-hour O_3 CAAQS, while the Imperial Valley (which is the Imperial County portion of the Salton Sea Air Basin) is designated as nonattainment area for state PM_{10}. The Basin's western Riverside County portion is designated as nonattainment for the 8-hour O_3 and PM_{10} CAAQS. The entire county is designated as a state nonattainment area for O_3 and PM_{10}. The Coachella Valley, located in the Basin and under SCAQMD's jurisdiction, is designated nonattainment for PM_{10}. In addition, localized CO concentrations, also known as CO "hotspots," may occur at heavily traveled roadways, particularly at intersections or other locations where the traffic is congested and vehicles idle for prolonged periods. CO concentrations exceeding the existing standard may occur at intersections that operate at Level of Service D or worse.

California Clean Air Act

In 1988, the California Legislature passed the CCAA (California Health and Safety Code section 39600 et seq.), which, like the Federal CAA, called for designations of areas as attainment or nonattainment, based on state rather than Federal standards. The CCAA requires air quality plans to be prepared for state areas

[1] The exemptions are set out in 40 CFR section 93.153, subdivisions (c) and (d) and include activities that would result in no emissions increase or an increase in emissions that is clearly de minimis. None of these exemptions apply here.

that have not demonstrated they have met state air quality standards for O_3, CO, nitrogen oxides (NO_x), and SO_2. These plans require a range of control measures.

California Air Resources Board (CARB)

CARB is the state agency responsible for regulating air quality. CARB's responsibilities include establishing state ambient air quality standards, emissions standards, and regulations for mobile emissions sources (e.g., autos, trucks, etc.), as well as overseeing the efforts of countywide and multicounty air pollution control districts, which have primary responsibility over stationary sources. The emission standards most relevant to the SCH Project are those related to automobiles, light- and medium-duty trucks, and California heavy-duty truck and construction equipment engines. CARB also regulates vehicle fuels with the intent to reduce emissions; to this end, CARB has set emission reduction performance requirements for gasoline (California reformulated gasoline) and has stringently limited the sulfur and aromatic content of diesel fuel to make it burn cleaner. CARB also sets the standards used to pass or fail vehicles in smog-check and heavy-duty truck inspection programs.

3.3.2.4 Source-Specific Regulations

Nonroad Engine Standards

CARB regulates mobile sources of air pollution in the state of California. Self-propelled off-road construction equipment is considered a vehicle, as defined by the California Vehicle Code. A vehicle may have an engine that both propels the vehicle and powers equipment mounted on the vehicle. As such, vehicles are generally exempt from regulation by local air districts. However, not included in exemption provisions is any equipment mounted on a vehicle that would otherwise require a permit per ICAPCD's rules and regulations.

Federal Tier 1 standards for off-road diesel engines were adopted as part of the California requirements for 1995. Federal Tier 2 and Tier 3 standards were adopted in 2000 and selectively apply to the full range of diesel off-road engine power categories. Both Tier 2 and 3 standards include durability requirements to ensure compliance with the standards throughout the useful life of the engine (40 CFR sections 89.112, 13; California Code of Regulations [CCR] section 2423).

Air Toxics Control Measures

On July 26, 2007, CARB adopted a regulation to reduce diesel particulate matter (DPM) and NO_x emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. Not included in this category are locomotives, commercial marine vessels, marine engines over 50 horsepower, or recreational vehicles (RVs). This regulation supplements existing tiered emission standards for off-road diesel engines in California (CARB 2010e).

Senate Bill 656

Senate Bill 656 is a planning requirement that calls for a plan and strategy for reducing $PM_{2.5}$ and PM_{10}. This bill requires CARB to identify, develop, and adopt a list of control measures to reduce $PM_{2.5}$ and PM_{10} emissions from new and existing stationary, mobile, and area sources. ICAPCD has developed particulate matter control measures and submitted plans to CARB that include lists of measures to reduce particulate matter. Under the plans, ICAPCD is required to continue to assess $PM_{2.5}$ and PM_{10} emissions and their impacts.

Toxic Air Contaminants

A project with the potential to expose sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants (TACs), as designated by CARB under 17 CCR section 93001 would be deemed to have a significant impact. Projects that would locate receptors near existing TAC sources are included, as well as projects that would place TAC sources near existing receptors.

Projects that have the potential to expose the public to TACs in excess of the following thresholds would be considered to have a significant air quality impact for receptors within 1,000 feet of a source boundary. These thresholds, which are based on the neighboring SCAQMD Rule 1401(d), are as follows:

- Maximum Individual Cancer Risk (MICR) and Cancer Burden - Pursuant to this rule, the cumulative increase in MICR (the sum of the MICR values for all TACs from the permit unit) shall not result in any of the following:
    - An increased MICR greater than one in one million (1.0 x 10-6) at any receptor location, if the permit unit is constructed without Toxic Best Available Control Technology (TBACT);
    - An increased MICR greater than 10 in 1 million (1.0 x 10-5) at any receptor location, if the permit unit is constructed with TBACT;
    - A population cancer burden greater than 0.5.
- Chronic Hazard Index (HI) - The cumulative increase in total chronic HI for any target organ system due to total emissions from the permit unit for which applications were deemed complete on or after the date when the risk value for the compound is finalized by the Office of Environmental Health Hazard Assessment, unless paragraph (e)(3) applies, will not exceed 1.0 at any receptor location.
- Acute Hazard Index- The cumulative increase in total acute HI for any target organ system due to total emissions from the new, relocated, or modified permit unit for which applications were deemed complete on or after the date when the risk value for the compound is finalized by the Office of Environmental Health Hazard Assessment, unless paragraph (e)(3) applies, will not exceed 1.0 at any receptor location.
- Risk Per Year - The risk per year will not exceed 1/70 of the maximum allowable risk specified in (d)(1)(A) or (d)(1)(B) at any receptor locations in residential areas.

DPM is considered a TAC in California (Bay Area Air Quality Management District 2008).

Portable Equipment Registration Program (PERP)

The statewide PERP establishes a uniform program to regulate portable engines and portable engine-driven equipment units. Once registered in PERP, engines and equipment units may operate throughout the state of California without the need to obtain individual permits from local air districts. Owners or operators of portable engines and certain types of equipment can register their units under the PERP to operate their equipment anywhere in the state.

The Project is not subject to ICAPCD's Authority to Construct requirements because the Project would not include construction of any stationary air pollution sources that are subject to ICAPCD's review (all permanently installed water pumps would be electrically operated).

Nuisance (Odors)

ICAPCD's Rule 407 states that "No Person shall discharge from any Source whatsoever such quantities of Air Contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property."

3.3.2.5 Local Regulations

ICAPCD is the regional agency responsible for air quality regulation within the study area. ICAPCD regulates air quality through planning and review activities and has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits; it can also impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. Regulation VIII, Fugitive Dust Control Measures includes standard measures that are required at all construction sites, regardless of size in order to reduce PM_{10} emissions (refer to Appendix G). ICAPCD also regulates new or expanding stationary TAC sources. ICAPCD indirectly regulates construction projects that use mobile sources via the statewide PERP discussed above. Since none of the Project alternatives would include equipment that meets the definition of a permanent stationary source, no Authority to Construct (Permit) would be required from ICAPCD.

3.3.3 Affected Environment

The pollutants of greatest concern in the Salton Sea Air Basin are O_3 and O_3 precursors, NO_x, and volatile organic compounds (VOCs)[2], largely due to fuel combustion in vehicles and equipment, and PM_{10} and $PM_{2.5}$ from soil disturbance and wind erosion (in the form of fugitive dust). Agricultural operations and transport of pollutants from Mexico also affect local air quality conditions.

3.3.3.1 Climate and Meteorological Conditions

The climate of the Salton Sea Air Basin area is typical desert, with large daily and seasonal fluctuations in temperature and relatively high annual average temperatures. High temperatures frequently exceed 100 degrees Fahrenheit (°F) during the summer months. In winter, temperatures can drop to near freezing (and below freezing at higher elevations). Throughout the year, average daily relative humidity is low, as are average rainfall values. Meteorological data listed in Table 3.3-3 are for the period September 2009 through October 2010 for the California Irrigation Management Information System (CIMIS) meteorological stations overseen in the Imperial/Coachella Valley region by the Office of Water Use Efficiency, California Department of Water Resources (DWR).

Table 3.3-3 Meteorological Data for the Imperial/Coachella Valley Region (September 2009–October 2010)

Station		Temperature (°F)			Relative Humidity (%)			Rain (inches)	Wind (mph)	
CIMIS Number	Name	Max	Min	Avg	Max	Min	Avg		Avg	Max
41	Calipatria/Mulberry	106.9	36.3	69.6	87	18	47	1.44	4.5	5.9
68	Seeley	105.1	40.7	71.8	81	19	41	1.55	5.4	8.0

[2] The terms volatile organic compounds (VOCs), nonmethane hydrocarbons (NMHC), and reactive organic gases/compounds (ROGs/ROCs) are used synonymously.

Table 3.3-3 Meteorological Data for the Imperial/Coachella Valley Region (September 2009–October 2010)

Station		Temperature (°F)			Relative Humidity (%)			Rain (inches)	Wind (mph)	
CIMIS Number	Name	Max	Min	Avg	Max	Min	Avg		Avg	Max
87	Meloland	106.6	40.0	71.6	77	19	43	3.16	5.4	7.6
118	Cathedral City	103.3	42.6	70.9	69	15	37	0.0	2.5	3.3
127	Salton Sea West	103.6	47.1	73.8	69	14	38	NA	5.7	6.9
128	Salton Sea East	109.5	41.3	72.3	93	23	55	NA	5.8	8.4
135	Blythe NE	104.5	36.7	69.5	94	17	45	3.72	5.6	7.3
136	Oasis	105.1	42.1	56.2	97	13	41	1.44	4.6	5.8
151	Ripley	102.3	34.9	68.9	93	17	45	2.15	4.9	6.2
175	Palo Verde II	104.0	32.9	67.8	90	21	47	0.0	3.3	5.4
186	UC-San Luis	104.4	36.8	77.5	91	11	41	3.17	3.7	5.1

Source: CIMIS 2010.
Note: Period of Record – September 2009 through October 2010.
Avg = average
Max = maximum
Min = minimum
NA = not available

A description of meteorological conditions (which follow) for the Salton Sea Air Basin was obtained from the Imperial County General Plan (County of Imperial 2008). Temperature patterns are similar throughout the Basin, and climatic conditions are influenced by large-scale warming and sinking of air in the semipermanent subtropical high-pressure center over the Pacific Ocean. The high-pressure ridge blocks most mid-latitude storms, except in the winter when the high-pressure ridge is further south and at its weakest. The coastal mountains obstruct the cool, damp air found in California's coastal regions.

The flat terrain and strong temperature differentials created by the intense heating and cooling patterns produce moderate winds and deep thermal circulation systems. Thus, even though the summers are hot, the general dispersion of local air pollution is greater than in the coastal basins where polluted inversion layers may remain for long periods.

Daily temperature fluctuations and seasonal variations can be extreme. Clear skies and rapid heating and cooling of desert soils result in high daytime temperatures followed by rapid cooling at night. Daily temperatures range from the mid-40s to low-70s°F in winter, and from the low-70s to mid-100s°F in summer. The average annual rainfall is about 3 inches, while the average annual air temperature is about 72°F.

Microclimate

The discussion of microclimate is taken from the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (DWR and California Department of Fish and Game [DFG] 2007). The Sea affects the extreme desert climate by creating its own microclimate. The most notable

features of this local microclimate are the Sea's moderating effect on temperature and the creation of localized wind patterns, or lake breezes, resulting from the differential heating of the land and water surface.

The Salton Sea also has a seasonal effect on local temperature. Lakes of this size can retain heat during the cooler months of the year, and influence nearshore temperatures. Conversely, the Sea causes a slight cooling effect nearshore during warmer months, occurring without the more noticeable lake breeze effect. Agricultural land near the shoreline can benefit from these temperature effects, which can extend growing seasons.

Lake breezes are the result of differential heating of land and water surfaces and are most pronounced near large water bodies, such as the Salton Sea, that have noticeable temperature differences compared with the adjacent land. Daytime onshore breezes are created when the land heats faster than the nearby water surface, causing the air over the land to rise and cooler air over the water to move in over the land. At night, circulation is reversed as the water retains heat while the land cools quickly. Because the temperature differences between the water and land surfaces govern the lake breeze circulation, winds are usually strongest during the daytime close to the shoreline and are reduced with distance inland. Through the daytime lake breeze circulation, a pronounced effect on temperatures near the shoreline can be experienced as cooler air moves onshore during the day (County of Imperial 1993, as cited in DWR and DFG 2007).

Wind patterns in the Salton Sea area are strongly influenced by topography and by its northwest/southeast trend as a result of major terrain features. The Santa Rosa Mountains trend northwest/southeast along and beyond the Sea's western side, while the Chocolate Mountains trend northwest/southeast on the Sea's eastern side about halfway down the Sea's length. Smaller-scale mountains continue on the Sea's eastern edge. These terrain features form barriers to air flow and affect the climate and the winds in the area.

Consistent with these terrain features, the Coachella Valley to the northwest and the Imperial Valley to the southeast influence area winds as well as the Salton Sea itself. No strong frontal systems or strong gradients between high- and low-pressure areas would result in regionally dominant wind direction, and subsequently winds from the Coachella and Imperial valleys tend to converge in the Sea's vicinity, creating complex airflow patterns that differ from north to south. Because of the dynamics established by the various mountains, valleys, and the water surface, and in response to extreme summer temperatures, wind conditions vary significantly over short distances at the Sea.

3.3.3.2 Criteria Air Pollutants

A criteria or regulated air pollutant is any air pollutant for which ambient air quality standards have been set by USEPA or CARB. Primary air quality standards are established to protect human (public) health. Secondary air quality standards are designed to protect public welfare from effects such as diminished production and quality of agricultural crops, reduced visibility, degraded soils, materials and infrastructure damage, and damaged vegetation. Criteria pollutants include O_3, NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$. The six most prevalent criteria pollutants and their potential health effects are described below. While ambient standards exist for lead (Pb)[3], sulfates (as SO_4)[4], hydrogen sulfide (H_2S)[5], and vinyl chloride (C_2H_3Cl)[6] (Table 3.3-2), these would not be emitted in quantifiable amounts and would have no measureable impact on ambient air quality in the study area. In particular, the use of California ultra-low

[3] Mainly associated with demolition of old buildings with lead paint surfaces; formerly associated with use of tetraethyl lead as an octane booster in leaded gasoline (still used in aviation and racing fuels).
[4] Commonly found in sea spray and alkali dust (dry lake beds).
[5] Mainly associated with oil and gas production.
[6] Common monomer used in plastics manufacture (i.e., polyvinylchloride).

sulfur diesel fuel in off-road equipment and on-road vehicles (trucks) precludes significant emissions of SO_2, and results in only trace amounts of H_2S and SO_4.

Ozone

Ground-level O_3 is a secondary pollutant formed in the atmosphere by a series of complex chemical reactions and transformations in the presence of sunlight above urban areas due to the mixing effects of temperature inversions. NO_x and ROGs[7] are the principal constituents in these reactions. NO_x and ROG emissions are predominantly attributed to mobile sources (on-road motor vehicles and other mobile sources). Thus, regulation and control of NO_x and ROGs from these sources is essential to reduce the formation of ground-level O_3.

O_3 is a strong irritating gas that can chemically burn and cause narrowing of airways, forcing the lungs and heart to work harder to provide oxygen to the body. A powerful oxidant, O_3 is capable of destroying organic matter, including human lung and airway tissue; it essentially burns through cell walls. O_3 damages cells in the lungs, making the passages inflamed and swollen. O_3 also causes shortness of breath, nasal congestion, coughing, eye irritation, sore throat, headache, chest discomfort, breathing pain, throat dryness, wheezing, fatigue, and nausea. It can damage alveoli, the individual air sacs in the lungs where oxygen and carbon dioxide are exchanged. O_3 has been associated with a decrease in resistance to infections. People most likely to be affected by O_3 include the elderly, the young, and athletes. O_3 may pose its worst health threat to people who already suffer from respiratory diseases such as asthma, emphysema, and chronic bronchitis (Ventura County Air Pollution Control District [VCAPCD] 2003).

Nitrogen Dioxide

NO_2 is formed in the atmosphere primarily by the rapid reaction of the colorless gas nitric oxide (NO) with atmospheric oxygen. It is a reddish brown gas with an odor similar to that of bleach. NO_2 participates in the photochemical reactions that result in O_3. The greatest source of NO, and subsequently NO_2, is the high-temperature combustion of fossil fuels such as in motor vehicle engines and power plant boilers. NO_2 and NO are referred to collectively as NO_x. NO_2 can irritate and damage the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections such as influenza. Researchers have identified harmful effects, similar to those caused by O_3, with progressive changes over 4 hours of exposure causing impaired pulmonary function, increased incidence of acute respiratory disease, and difficult breathing for both bronchitis sufferers and healthy persons (VCAPCD 2003).

Carbon Monoxide

CO is a common, colorless, odorless, highly toxic gas. It is produced by natural and anthropogenic (caused by human activity) combustion processes. The major CO source in urban areas is incomplete combustion of carbon-containing fuels (primarily gasoline, diesel fuel, and natural gas). However, it also results from combustion processes including forest fires and agricultural burning. Ambient CO concentrations are generally higher in the winter, usually on cold, clear days and nights with little or no wind. Low wind speeds inhibit horizontal dispersion, and surface inversions inhibit vertical mixing. Traffic-congested intersections have the potential to result in localized high CO levels.

When inhaled, CO does not directly harm the lungs. The impact from CO is on oxygenation of the entire body. CO combines chemically with hemoglobin, the oxygen-transporting component of blood, which diminishes the ability of blood to carry oxygen to the brain, heart, and other vital organs. Red blood cells have 220 times the attraction for CO as for oxygen. This affinity interferes with movement of oxygen to the body's tissues. Effects from CO exposure include headaches, nausea, and death. People with heart ailments are at risk from low-level exposure to CO. Also sensitive are people with chronic respiratory

[7] Also referred to as reactive organic compounds or VOCs.

disease, the elderly, infants and fetuses, and people suffering from anemia and other conditions that affect the oxygen-carrying capacity of blood. High CO levels in a concentrated area can result in asphyxiation. Studies show a synergistic effect when CO and O_3 are combined (VCAPCD 2003).

Sulfur Dioxide

SO_2 is a colorless gas with a sharp, irritating odor. It can react in the atmosphere to produce sulfuric acid and sulfates, which contribute to acid deposition and atmospheric visibility reduction. It also contributes to the formation of PM_{10}. Most of the SO_2 emitted into the atmosphere is from burning sulfur-containing fossil fuels by mobile sources such as marine vessels and farm equipment and stationary fuel combustion. SO_2 irritates the mucous membranes of the eyes and nose and may also affect the mouth, trachea, and lungs. Healthy people may experience sore throats, coughing, and breathing difficulties when exposed to high concentrations. SO_2 causes constriction of the airways and poses a health hazard to asthmatics, which are very sensitive to SO_2. Children often experience more respiratory tract infections when they are exposed to SO_2 (VCAPCD 2003).

Respirable Particulate Matter, 10 Microns

PM_{10} consists of particulate matter, fine dusts and aerosols, 10 microns or smaller in diameter. When inhaled, particles larger than 10 microns generally are caught in the nose and throat and do not enter the lungs. PM_{10} can enter the large upper branches of the lungs just below the throat, where they are caught and removed (by coughing, spitting, or swallowing).

The primary PM_{10} sources include dust from paved and unpaved roads and construction and demolition operations. Lesser PM_{10} sources include wind erosion, agricultural operations, residential wood combustion, smoke, tailpipe emissions, and industrial sources. These sources have different constituents and, therefore, varying effects on health. Road dust is composed of many particles other than soil dust. It also includes engine exhaust, tire rubber, oil, and truckload spills. DPM contains many toxic particle and elemental carbon (soot) and is considered a TAC in California. Airborne particles absorb and adsorb toxic substances and can be inhaled and lodged in the lungs. Once in the lungs, the toxic substances can be absorbed into the bloodstream and carried throughout the body. PM_{10} concentrations tend to be lower during the winter months because weather greatly affects PM_{10} concentrations. During rain, concentrations are relatively low, and on windy days, PM_{10} levels can be high. Photochemical aerosols, formed by chemical reactions with human-made emissions, may also influence PM_{10} concentrations.

Elevated ambient particulate levels are associated with premature death, an increased number of asthma attacks, reduced lung function, aggravation of bronchitis, respiratory disease, cancer, and other serious health effects. Short-term exposure to particulates can lead to coughing, minor throat irritation, and a reduction in lung function. Long-term exposure can be more harmful. USEPA estimates that 8 percent of urban nonsmoker lung cancer risk is due to PM_{10} in soot from diesel trucks, buses, and cars. Additional studies by USEPA and the Harvard School of Public Health estimate that 50,000 to 60,000 deaths per year in the United States are caused by particulates. PM_{10} particles collect in the upper portion of the respiratory system, affecting the bronchial tubes, nose, and throat. They contribute to aggravation of asthma, premature death, increased number of asthma attacks, bronchitis, reduced lung function, respiratory disease, aggravation of respiratory and cardiovascular disease, alteration of lung tissue and structure, changes in respiratory defense mechanisms, and cancer (VCAPCD 2003).

Fine Particulate Matter, 2.5 Microns

$PM_{2.5}$ is a mixture of particulate matter, fine dusts and aerosols, 2.5 microns or smaller in aerodynamic diameter. $PM_{2.5}$ can enter the deepest portions of the lungs where gas exchange occurs between the air and the blood stream. They are the most dangerous particles because the lungs have no efficient mechanisms for removing them. If these particles are soluble in water, they pass directly into the blood

stream within minutes. If they are not soluble in water, they are retained deep in the lungs and can remain there permanently, which increases the risks of long-term disease including chronic respiratory disease, cancer, and increased and premature death. Other effects include increased respiratory stress and disease, decreased lung function, alterations in lung tissue and structure, and alterations in respiratory tract defense mechanisms.

$PM_{2.5}$ particles are emitted from activities such as industrial and residential combustion processes, wood burning, and from diesel- and gasoline-powered vehicles. They are also formed in the atmosphere from gases such as SO_2, NO_x, ammonia, and VOCs that are emitted from combustion activities and then become particles as a result of chemical transformations in the air (secondary particles) (VCAPCD 2003).

3.3.3.3 Sources of Air Pollutants

The most significant regional O_3, NO_2, and CO sources in ambient air are automobiles, trucks, and other on-road vehicles, along with trains, vessels, and aircraft. O_3 is not directly emitted; rather, photochemical O_3 is formed by the atmospheric reaction of VOCs and NO_X in sunlight. Gasoline and diesel engines emit VOCs and NO_X as combustion products, as does natural gas-fired equipment (stationary sources) such as pump engines, gas turbine generators, process heaters, and steam boilers. Vehicle emissions from traffic along State Route (SR)-78, SR-86, SR-111, and other roadways are the greatest contributors to local pollutants.

Local PM_{10} emissions are primarily the result of fugitive dust from travel on unpaved roads, as well as construction and agricultural activities. Coarser particles also may be emitted from activities that disturb the topsoil. Other sources include wind-blown dust, pollen, salts, brake dust, and tire wear. Although $PM_{2.5}$ is a subset of PM_{10}, it differs from the rest of PM_{10}. While most of the ambient PM_{10} results from direct emissions of the pollutant, a significant amount of the ambient $PM_{2.5}$ results from transformation of precursors and condensing of gaseous pollutants in the atmosphere. Other than direct $PM_{2.5}$ emissions, the key pollutants contributing to $PM_{2.5}$ concentrations in the atmosphere are SO_2, NO_x, VOCs, and ammonia (CARB 2005). The most prevalent airborne pollutant in the Salton Sea Air Basin is particulate matter as fugitive dust. Within the Basin, fugitive windblown dust, wind erosion of exposed soil (from agricultural fields and the desert), and vehicle travel over unpaved roads are the major PM_{10} sources (DWR and DFG 2007).

3.3.3.4 Ambient Air Quality

Air quality is affected by a variety of sources in the Project vicinity. Industry in the vicinity includes geothermal power plants, but processes here do not result in heavy emissions of pollutants. Light motor vehicles, diesel-powered construction equipment, and commercial trucks used in the Project area are the most common source of pollutants. Noncombustion PM_{10} and $PM_{2.5}$ sources include fugitive dust from roads, construction, demolition, and earthmoving. Finally, commercial and general aviation aircraft generate emissions that affect air quality. The Salton Sea Air Basin has high levels of ground-level O_3, transported into the Basin from urban areas to the west and northwest of the Basin. Vehicles, trains, construction equipment, and farming equipment are the primary O_3 precursor emission sources (NO_x and ROG) in the Basin (CARB 2006).

O_3 is a secondary pollutant that is not emitted directly by sources, but rather is formed by a reaction between NO_x and reactive organic compounds in the presence of sunlight. Reductions in O_3 concentrations are dependent upon reducing emissions of these precursors. The major O_3 precursor sources in the Salton Sea Air Basin are motor vehicles and other mobile equipment (including agricultural equipment), and nonelectric agricultural water pumping.

ICAPCD and SCAQMD operate extensive regional air monitoring networks comprised of monitoring stations that collectively measure the ambient concentrations of criteria air pollutants including O_3, NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$.

Tables 3.3-4, 3.3-5, and 3.3-6 show a 10-year summary of monitoring data (2000 to 2009) obtained for the Salton Sea Air Basin for O_3, PM_{10}, and $PM_{2.5}$, respectively.

Table 3.3-4 Salton Sea Air Basin Ozone Exceedances (2000 to 2009)

Year	Days Over Standards			1-Hour Maximums		8-Hour Averages			
	State		National	State Max	State DV	State Max	State DV	Nat. Max	Nat. DV
	1-hour	8-hour	8-hour	ppmv	ppmv	ppmv	ppmv	ppmv	1-hour
2009	40	82	59	0.150	0.120	0.098	0.102	0.098	0.096
2008	36	85	57	0.135	0.120	0.101	0.105	0.101	0.097
2007	39	99	68	0.126	0.130	0.102	0.116	0.102	0.101
2006	51	94	72	0.129	0.130	0.109	0.116	0.109	0.102
2005	54	102	77	0.139	0.130	0.116	0.116	0.116	0.104
2004	48	108	71	0.125	0.130	0.107	0.120	0.106	0.104
2003	66	101	77	0.144	0.160	0.110	0.120	0.110	0.108
2002	68	117	92	0.156	0.160	0.125	0.120	0.124	0.105
2001	81	111	86	0.167	0.160	0.114	0.114	0.113	0.100
2000	54	100	70	0.169	0.140	0.114	0.114	0.113	0.099
Total	**537**	**999**	**729**						

Source: CARB 2010d
Note:
DV = State Designation Value or National (Nat.) Design Value as applicable.

Table 3.3-5 Salton Sea Air Basin PM_{10} Exceedances (2000 to 2009)

Year	Estimated Days Over Standards		Annual Averages		3-Year Averages		24-Hour Maximums	
			National	State	National		National	State
	National	State	µg/m³	µg/m³	National	State	µg/m³	µg/m³
2009	ND	207	ND	65	ND	66	276	266
2008	ND	187	54	54	59	66	337	138
2007	ND	219	66	66	60	72	291	296
2006	ND	241	71	72	57	72	248	261
2005	ND	160	53	53	65	80	211	220
2004	ND	220	61	60	74	81	201	195
2003	ND	284	80	80	82	87	840	848
2002	ND	305	80	81	86	87	373	361
2001	ND	312	86	87	85	87	647	634
2000	ND	313	95	85	79	85	268	279
Total	**ND**	**2448**						

Source: CARB 2010d

Note:
ND = No Data or Insufficient Data for determination

Table 3.3-6 Salton Sea Air Basin $PM_{2.5}$ Exceedances (2000 to 2009)

Year	Annual Averages				2006 National 24-Hour Standard			24-Hour Maximums	
	National	Nat. DV	State	State DV	98th %	Nat. DV	Estimated Days Over	National	State
	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³	µg/m³		µg/m³	µg/m³
2009	8.0	7.4	18.7	23.0	39.9	34.0	3	45.0	100.9
2008	8.3	ND	17.2	23.0	24.0	36.0	0	37.1	93.6
2007	13.0	8.9	23.2	23.0	38.5	42.0	9	66.7	95.0
2006	12.5	9.3	17.3	17.0	46.0	40.0	17	68.8	80.8
2005	9.4	9.4	15.5	16.0	41.1	39.0	3	67.6	85.2
2004	11.8	11.3	16.1	16.0	31.9	40.0	4	74.2	76.0
2003	11.4	11.8	11.4	15.0	44.3	46.0	0	65.1	153.6
2002	15.1	15.6	15.1	15.0	44.1	50.0	19	46.5	142.7
2001	14.9	15.7	ND	11.0	50.4	49.0	3	60.2	60.2
2000	16.9	ND	11.2	11.0	56.0	ND	21	84.2	84.2
						Total	**79**		

Source: CARB 2010d

Notes:
ND = No Data or Insufficient Data for determination; DV = State Designation Value or National (Nat.) Design Value as applicable

3.3.3.5 Attainment Status Designations

Current California and Federal attainment status designations are listed in Table 3.3-7 for the Salton Sea Air Basin.

Table 3.3-7 Federal and California Air Quality Attainment Status Designations for the Salton Sea Air Basin

Criteria Pollutant	State Designation	Federal Designation
Ozone (O_3) (1-hour)	Moderate/Extreme Nonattainment[c]	n/a
Ozone (O_3) (8-hour)	Nonattainment	Moderate Nonattainment[a]
Nitrogen Dioxide (NO_2) (1-hour)	Attainment	Attainment
Nitrogen Dioxide (NO_2) (annual)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment/Unclassified[d]
Carbon Monoxide (CO)	Attainment	Attainment
Resp. Particulates (as PM_{10}) (24-hour)	Serious Nonattainment	Serious Nonattainment
Resp. Particulates (as PM_{10}) (annual)	Nonattainment	n/a
Fine Particulates (as $PM_{2.5}$) (24-hour)	n/a	Nonattainment
Fine Particulates (as $PM_{2.5}$) (annual)	Unclassified[b]	Unclassified[b]
Lead (Pb)	Attainment	Attainment
Sulfates (as SO_4)	Attainment	(no Federal standard)
Hydrogen Sulfide (H_2S)	Unclassified[b]	(no Federal standard)
Vinyl Chloride (C_2H_3Cl)	n/d	(no Federal standard)
Visibility	Unclassified	(no Federal standard)

Sources: CARB 2010d; ICAPCD 2010b

Notes:

[a] The 0.08 ppmv Federal 8-hour O_3 standard applied until 2008; 0.075 ppmv thereafter

[b] If available data do not support a designation of attainment or nonattainment, the area is designated unclassified

[c] Moderate in Imperial County (ICAPCD), Extreme in Riverside County (SCAQMD)

[d] Attainment in Imperial County (ICAPCD), Unclassified in Riverside County (SCAQMD)

n/a = not applicable

n/d = no data/information

Imperial County Attainment Status and Applicable Plans

Imperial County is designated as moderate nonattainment for the Federal 8-hour O_3 NAAQS. The Imperial Valley (which is the Imperial County portion of the Salton Sea Air Basin) is designated as Federal serious nonattainment area for PM_{10} and nonattainment for $PM_{2.5}$. All areas of the County are designated as attainment for CO, NO_2, and SO_2 NAAQS. Imperial County is designated as nonattainment for O_3 and PM_{10} CAAQS. The entire County is designated attainment or unclassified for $PM_{2.5}$, CO, NO_2, and SO_2 CAAQS.

In 2003, the Federal Ninth Circuit Court of Appeals determined that USEPA's conclusion that PM_{10} attainment would be achieved, except for the negative effects of transborder emissions from Mexico, was

unsupported. The court required USEPA to reclassify Imperial Valley from moderate to serious nonattainment (Opinion No. 01-71902, October 9, 2003) (U.S. Department of Energy and Bureau of Land Management 2004). In addition to emissions transported from Mexico, particulate matter emissions in Imperial County result from agricultural activity and other local sources. The primary sources include windblown dust from natural and disturbed land areas and dust associated with vehicles using paved and unpaved roads. Construction and agriculture also affect ambient particulate levels.

As part of USEPA's final ruling, a Reasonably Available Control Technology (RACT) demonstration was also required. RACTs are emission control technologies that are economically and technically feasible. In compliance with this requirement, ICAPCD released the *2009 Reasonable Available Control Technology (RACT) State Implementation Plan* (ICAPCD 2010a).

As a result of the area's designation as Federal serious nonattainment for PM_{10}, ICAPCD has prepared a number of documents and regulations to support an update of the existing SIP for PM_{10} in the Imperial Valley. In May 2004, ICAPCD published *Development of a Wind Blown Fugitive Dust Model and Inventory for Imperial County, California*, Final Report (ICAPCD 2004). In August 2005, ICAPCD released their *Imperial County Natural Events Action Plan* (IPAQCD 2005, as cited in DWR and DFG 2007), to allow exclusion of certain qualifying natural events from attainment, to allow exclusion of certain qualifying natural events from attainment determinations and the *Draft Final Technical Memorandum Regulation VIII Best Available Control Measures Analysis* was published in October 2005, and used as the basis for rulemaking for regulations to control particulate matter (ICAPCD 2005). In November 2005, ICAPCD's Board adopted a new series of Regulation VIII rules for dust control (general requirements, construction and earthmoving activities, bulk materials, open areas, and conservation management practices), which are required for all projects.

Based on USEPA and CARB comments on the 2004 dust inventory, a revised emissions inventory was published as an appendix to the October best available control measures analysis: *Appendix A Technical Memorandum: Latest Revisions of the Windblown Dust Study* (ICAPCD 2005). ICAPCD has prepared their emissions inventory and best available control measures rulemakings in advance of the development and approval of a SIP, to expedite best available control measures emissions reductions.

In August 2009, ICAPCD released the *2009 Imperial County State Implementation Plan for Particulate Matter Less than 10 Microns in Aerodynamic Diameter* (ICAPCD 2009). This document presents the SIP for PM_{10} on ICAPCD's behalf.

On December 3, 2009, USEPA issued a final ruling determining that the Imperial County moderate 8-hour O_3 attainment area attained the 1998 8-hour standard. Because this determination does not constitute a redesignation to attainment under CAA section 107(d)(3), the designation will remain moderate nonattainment for the 1997 8-hour O_3 standard (ICAPCD 2010b). ICAPCD submitted a *Final 2009 8-Hour Ozone Modified Air Quality Management Plan* in July 2010 to USEPA, in compliance with Federal regulations (ICAPCD 2010b). This AQMD serves as a comprehensive planning document intended to provide guidance to ICAPCD, county, and other local agencies on how to continue to maintain the 1997 8-hour O_3 NAAQS (ICAPCD 2010b).

3.3.3.6 Regional Emissions Inventory

In the Salton Sea Air Basin, O_3 and PM_{10} are the primary pollutants of concern based on the exceedance of ambient air quality standards. O_3 is a seasonal problem resulting from photochemical reactions of ROGs and NO_x in the presence of sunlight, occurring predominantly from May through October.

Table 3.3-8 presents the annual average daily emissions rates for the estimated 2008 regional emissions inventory for the Salton Sea Air Basin, as compiled by CARB (2010d).

Table 3.3-8 Estimated 2008 Regional Emissions Inventory – Annual Average Daily Emissions Rates for All Sources in Salton Sea Air Basin

	Criteria Pollutant				
	NO_x	PM_{10}	CO	VOCs	SO_2
Air Basin	tons/day	tons/day	tons/day	tons/day	tons/day
Salton Sea Air Basin	83.3	250.9	176.2	48.1	0.7
Source: CARB 2010d					

The most prevalent airborne pollutant in the Salton Sea Air Basin is particulate matter in the form of fugitive dust. In the Basin, fugitive windblown dust, wind erosion of exposed soil (from agricultural fields and the desert), and vehicle travel over unpaved roads are the major PM_{10} sources.

Table 3.3-9 summarizes the 2008 estimated annual average emissions (in tons/day) for the Salton Sea Air Basin for each of the major PM_{10} emission source categories. Imperial County and Riverside County contributions are shown (CARB 2010a, b, c).

Table 3.3-9 Estimated 2008 Annual Average Daily PM_{10} Emissions in the Salton Sea Air Basin

	Imperial County	Riverside County	Total Salton Sea Air Basin
PM_{10} Emission Source	tons/day	tons/day	tons/day
Farming operations	10.37	1.03	10.75
Construction and demolition	2.01	25.94	10.99
Paved road dust	4.55	19.82	7.38
Unpaved road dust	34.94	7.3	36.87
Fugitive windblown dust	172.60	2.97	174.05
Total all sources in basinwide inventory	232.21	72.39	250.93
Source: CARB 2010a, b, c			

3.3.3.7 Sensitive Receptors

Certain population groups are considered more sensitive to air pollutants than others; in particular, children, elderly, and acutely ill and chronically ill persons, especially those with cardiorespiratory diseases such as asthma and bronchitis. Sensitive receptors (land uses) indicate locations where such individuals are typically found, namely schools, day care centers, hospitals, convalescent homes, residences of sensitive persons, and parks with active recreational uses, such as youth sports.

Persons engaged in strenuous work or physical exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses such as parks are also considered sensitive due to the greater exposure to ambient air quality conditions, and because the presence of pollution detracts from the recreational experience.

Imperial County is a predominantly rural, agricultural region, and population in its unincorporated areas tends to concentrate in agricultural areas and in recreational/retirement communities. Communities located on the Sea's shores, including Salton City, Salton Sea Beach, and Bombay Beach are primarily recreational communities, though increasingly their populations are becoming more diversified. These communities experience a notable increase in population during the winter months when visitors converge to avoid cold/wet winters in other parts of the country (County of Imperial 2008).

Red Hill Park is located immediately north of Sonny Bono Salton Sea National Wildlife Refuge adjacent to the Alamo River's mouth. The site supports picnic facilities offshore from the Salton Sea and a campground with RV hookups and additional picnic facilities (located on Red Hill Island's northern and eastern sides). Two of the trailers/RVs parked in the campground currently are occupied by long-term residents rather than short-term visitors (personal communication, K. Mercurio 2011). These residents are located approximately 1.5 miles from the area of potential impact.

Other receptors in the Project area include recreational users (such as campers, hunters, fishers, and birdwatchers); farm workers and residents at nearby farms; employees at the geothermal plants; and commuters/travelers on SR-86 between the intersection of SR-78 and Vendel Road. The most concentrated populations occur near the Sea's northern and southern shores.

3.3.3.8 Odor Conditions

The fairly continuous presence of odors at the Salton Sea currently affects both visitor and resident populations in the area. Factors contributing to odors at the Sea include water quality, high nutrient levels, and biological factors such as fish, algal, and bird mortality. The Sea's water quality is affected by a high concentration of sulfates and other compounds present in the saline Sea, as well as inputs of agricultural drainage. Nutrient-rich runoff entering the Sea produces eutrophic conditions that result in phytoplankton blooms. These microscopic plants float close to the Sea's surface, and offensive odors are created when large numbers of plants die and decompose. Odors resulting from algal bloom die-offs are most prevalent during the summer months, when inputs of freshwater to the Sea are low and temperatures are high (Salton Sea Authority and Bureau of Reclamation 2000).

Fish and bird die-offs at the Salton Sea also contribute to the odor problem. Several large die-offs in the past 2 decades have produced unpleasant odors as fish and birds decompose along the shoreline (Salton Sea Authority and Bureau of Reclamation 2000).

Odors produced by decaying algal blooms and fish and bird die-offs occur predominantly in the Salton Sea's southern and eastern portions, although all the Sea's areas are subject to these occurrences. The most prevalent odors exist during the summer months when temperatures are high and winds from the southeast are predominant. High winds in the Sea's area are most frequent during the months of April and May (Salton Sea Authority and Bureau of Reclamation 2000).

3.3.4 Impacts and Mitigation Measures

The following analysis estimates criteria emissions resulting from operation of construction equipment, passenger vehicle trips during construction and operation, transportation of construction materials and

equipment, and transportation of material inputs for operation or maintenance, and waste generation and disposal of materials during construction and operation (included in trucking).

3.3.4.1 Impact Analysis Methodology

Impacts on air quality would result from engine exhaust and fugitive dust (particulate) emissions of criteria pollutants caused by operation of off-road construction equipment and on-road vehicles, as well as by equipment proposed during Project operation. Detailed lists of construction equipment, anticipated construction schedules, operational equipment, and emission calculations are provided in Appendix G.

Emission calculations for off-road equipment and on-road vehicles were performed using the most recent emission factors published by SCAQMD (1993, updated in 2008)[8] and USEPA (2006, updated in 2011). Construction is expected to require about 2 years beginning in 2013, although potential delays related to weather, protection of sensitive resources, material delivery, and unforeseen underground conditions could occur. Extending the schedule longer than 2 years would not affect the air quality analysis because it is based on maximum daily emissions (pounds per day) and total emissions (tons), which would remain relatively unchanged. Since annual emissions would be below General Conformity thresholds, extending the schedule longer than 2 years would not affect the General Conformity determination.

Air quality impacts were assessed using significance thresholds established by ICAPCD for nonattainment pollutants and USEPA for attainment pollutants, which are listed in Table 3.3-10. General Conformity thresholds are listed in Table 3.3-11. The greatest potential for impacts would occur during the construction activities that result in ground disturbances (earthmoving), which causes fugitive dust to be entrained in the wind.

Table 3.3-10 Emissions Significance Thresholds - Salton Sea Air Basin Nonattainment Area

Criteria Pollutant	Imperial County APCD	
	Construction	Operation
	lbs/day	lbs/day
Volatile Organic Compounds (VOC as CH_4)	75	55
Carbon Monoxide (CO)	550	550
Oxides of Nitrogen (NO_X as NO_2)	100	55
Sulfur Dioxide (SO_X as SO_2)	--	150
Particulates (PM_{10})	150	150
Particulates ($PM_{2.5}$)	--	--
Lead (Pb)*	--	--

Sources: SCAQMD 1993, updated in 2008; ICAPCD 2007; 40 CFR section 51.166

Note:

* Prevention of Significant Deterioration (PSD): 0.6 tons per year lead

[8] ICAPCD does not publish its own emission factors per se; SCAQMD's off-road factors are based on Federal standards pursuant to 40 CFR 89.112; SCAQMD on-road factors are based on 40 CFR 86 et seq. vehicle category standards; SCAQMD's factors are output from CARB's OFFROAD and EMFAC applications, respectively, which reference the cited regulations.

Table 3.3-11 Emissions Significance Thresholds - General Conformity

Criteria Pollutant	Federal Nonattainment Status			
	Moderate	Serious	Severe	Extreme
	tons/year	tons/year	tons/year	tons/year
Volatile Organic Compounds (VOCs as CH_4)	n/a	50	25	10
Carbon Monoxide (CO)	100			
Oxides of Nitrogen (NO_X as NO_2)	n/a	50	25	10
Sulfur Dioxide (SO_X as SO_2)	100			
Particulates (PM_{10})	100	70	n/a	n/a
Particulates ($PM_{2.5}$)	100			
Lead (Pb)*	25			

Source: 40 CFR 6, 51, & 93 (58 Federal Register (FR) 63214)
Notes:
Other O_3 nonattainment areas outside an O_3 transport region, VOCs or NO_X: 50 tons/year
Other O_3 nonattainment areas inside an O_3 transport region, VOCs: 50 tons/year
Other O_3 nonattainment areas inside an O_3 transport region, NO_X: 100 tons/year

3.3.4.2 Thresholds of Significance

Significance Criteria

Impacts on air quality would be significant if the SCH Project would:

- Conflict with or obstruct implementation of an applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable/significant net increase in any criteria pollutant for which the alternative's region of influence is nonattainment under an applicable Federal or state ambient air standard (including releasing emissions that exceed quantitative thresholds for O3 precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people.; or
- Substantially modify the existing microclimate characteristics adjacent to the Salton Sea.

To assess a project's impact relative to the significance criteria established by CEQA, the ICAPCD has established air quality significance thresholds to determine whether air quality impacts from a project would be significant. If emissions would exceed any of the criteria listed in Table 3.3-10, they would be considered significant. For uniformity within the Salton Sea Air Basin, the ICAPCD criteria are essentially the same as the SCAQMD criteria.

ICAPCD has also defined significance thresholds for TACs or health effects. TAC emissions would be significant if the emissions exceeded acceptable levels or contributed significantly to the area's excess lifetime cancer risk values, cancer burden, or health hazard indices.

Application of Significance Criteria

- **Conflict with or obstruct implementation of an applicable air quality plan** – The Project alternatives would generate criteria pollutant emissions through fuel combustion resulting from construction activities, emissions from the transportation of goods and other materials to the sites, and workers traveling in vehicles to and from the sites during both construction and operation. During operation the Project would result in criteria air pollutant emissions from vehicles and earthmoving required for maintenance. The potential for these emissions to conflict with or obstruct applicable ICAPCD air quality plans is addressed, as is the potential for changes in Salton Sea elevation to result in increased fugitive dust emissions from exposed playa.
- **Violate any air quality standard or contribute substantially to an existing or projected air quality violation** – The Project alternatives would generate criteria pollutant emissions through fuel combustion resulting from construction activities, emissions from the transportation of goods and other materials to the sites, and workers traveling in vehicles to and from the sites during both construction and operation. During operation the Project would result in criteria air pollutant emissions from vehicles and earthmoving required for maintenance. The analysis includes a determination of whether these emissions would result in violation of an air quality standard or worsen an existing violation within the Salton Sea Air Basin.
- **Result in a cumulatively considerable/significant net increase in any criteria pollutant for which the alternative's region of influence is nonattainment** – The Project alternatives would generate criteria pollutant emissions through fuel combustion resulting from construction activities, emissions from the transportation of goods and other materials to the sites, and workers traveling in vehicles to and from the sites during both construction and operation. During operation, the Project would result

in criteria air pollutant emissions from vehicles and earthmoving required for maintenance. The potential for these activities to result in a cumulatively considerable/significant increase in any nonattainment criteria pollutant is addressed.

- **Expose sensitive receptors to substantial pollutant concentrations** – The Project alternatives would generate criteria pollutant emissions through fuel combustion resulting from construction activities, emissions from the transportation of goods and other materials to the sites, and workers traveling in vehicles to and from the sites during both construction and operation. During operation the Project would result in criteria air pollutant emissions from vehicles and earthmoving required for maintenance. The potential for these emissions, including toxic air contaminants, to result in exposure of sensitive receptors is addressed.
- **Create objectionable odors affecting a substantial number of people** – The potential for odors to result from construction or maintenance is addressed, as is the potential for odors to occur as a result of pond operations.
- **Substantially modify the existing microclimate characteristics adjacent to the Salton Sea** – The potential for the Project alternatives to modify the Sea's microclimate through pond creation is addressed below.

Emissions from the Project alternatives were compared to the ICAPCD significance thresholds shown in Table 3.3-10 above.

3.3.4.3 No Action Alternative

The description of the No Action Alternative in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (DWR and DFG 2007) is applicable to this analysis and is summarized below. Several major variables are at play, each with varying degrees of uncertainty. These variables include future population growth in the region, the extent of various emissions sources, emissivity of each source, and the success of the local jurisdictions and others in implementing effective air emissions control measures over the coming decades. Pollutant transport from Mexico also influences air quality compliance in the region.

The two most substantial changes are related to implementation of the Quantification Settlement Agreement (QSA) and the ongoing development and implementation of AQMPs and SIPs.

Quantification Settlement Agreement Implementation

QSA Implementation and the related Imperial Irrigation District (IID) Water Conservation and Transfer Project would reduce inflows to the Salton Sea, resulting in an increase in the amount of playa exposed over the next 75 years. The IID Water Conservation and Transfer Project Environmental Impact Statement/Report (EIS/EIR) and addendum projected an increase in exposed playa of about 45,000 acres over the 75-year period compared to the future baseline for that project.

To mitigate the potential air quality impacts from exposed playa, the IID Water Conservation and Transfer Project Mitigation Monitoring and Reporting Plan included a four-step air quality mitigation and monitoring plan (four-step air quality plan), as summarized below:

1. **Restrict Access.** Public access, especially off-highway vehicle access, would be limited, to the extent legally and practicably feasible, to minimize disturbance of natural crusts and soils surfaces in future exposed shoreline areas. Prevention of crust and soil disturbance is viewed as the most important and cost-effective measure available to avoid future dust impacts. IID or other governmental entities own or control most of the lands adjacent to and under the Salton Sea. Fencing and posting would be installed on these lands in areas adjacent to private lands or public areas to limit access.

2. **Research and Monitor.** A research and monitoring program would be implemented incrementally as the Salton Sea recedes. The research phase would focus on development of information to help define the potential for problems to occur in the future as the Sea's elevation is reduced slowly over time. Research would accomplish the following:

    a. Study historical information on dust emissions from exposed shoreline areas.

    b. Determine how much land would be exposed over time and who owns it.

    c. Conduct sampling to determine the composition of "representative" shoreline sediments and the concentrations of ions and minerals in salt mixtures at the Salton Sea. Review results from prior sampling efforts. Identify areas of future exposed shoreline with elevated concentrations of toxic substances relative to background.

    d. Analyze to predict response of Salton Sea salt crusts and sediments to environmental conditions, such as rainfall, humidity, temperature, and wind.

    e. Implement a meteorological, PM_{10}, and TAC monitoring program to begin under existing conditions and continue as the IID Water Conservation and Transfer Project is implemented. Monitoring would take place both near the sources (exposed shoreline caused by the Project) and near the receptors (populated areas) to assess the source receptor relationship. The goal of the monitoring program would be to observe PM_{10} problems or incremental increases in TAC concentrations associated with the increased exposure of Seabed to provide a basis for mitigation efforts.

    f. If incremental increases in TACs (such as arsenic or selenium, for example) are observed at the receptors and linked to emissions from exposed shoreline, conduct a health risk assessment to determine whether the increases exceed acceptable thresholds established by the governing air districts and represent a significant impact.

    g. If potential PM_{10} or health effects problem areas are identified through research and monitoring and the conditions leading to PM_{10} emissions are defined, study potential dust control measures specific to the identified problems and the conditions at the Salton Sea.

3. **Create or Purchase Offsetting Emission Reduction Credits.** This step would require negotiations with the local air pollution control districts to develop a long-term program for creating or purchasing offsetting PM_{10} emission reduction credits. Credits would be used to offset emissions caused by the IID Water Conservation and Transfer Project, as determined by monitoring (see Step 2, above).

4. **Direct Emission Reductions at the Salton Sea.** If sufficient offsetting emission reduction credits are not available or feasible, Step 4 of this mitigation plan would be implemented. It would include either one or a combination of the following:

    a. Implementing feasible dust mitigation measures. These mitigation measures include the potential implementation of new (and as yet unknown or unproven) dust control technologies that may be developed at any time during the term of the IID Water Conservation and Transfer Project Proposed Project.

    b. If feasible, supplying water to the Salton Sea to rewet emissive areas exposed by the IID Water Conservation and Transfer Project, based on the research and monitoring program (Step 2 of this plan). This approach could use and extend the duration of the Salton Sea Habitat Conservation Strategy. If, at any time during the Project term, feasible dust mitigation measures are identified, they could be implemented in lieu of other dust mitigation measures or the provision of mitigation water to the Salton Sea. Thus, it is anticipated that the method or combination of methods could change from time to time over the Project term.

The No Action Alternative includes implementation of this four-step air quality plan.

The enforcement, monitoring, and funding of implementation of the four-step air quality plan is established under a set of related documents, permits, agreements, and laws as described below.

IID Water Conservation and Transfer Project EIS/EIR, Addendum, and Mitigation, Monitoring, and Reporting Program

These documents, prepared by IID, describe the four-step air quality plan as mitigation for the impacts of exposing playa due to the reduction of inflows to the Salton Sea incidental to the transfer of water. However, note that even with this plan's implementation, the EIS/EIR for the IID Water Conservation and Transfer Project concluded that the air quality impact resulting from this project would be potentially significant and unavoidable.

Mitigation requirements for emissions resulting from exposed acres under the IID Water Conservation and Transfer Project were not for a specific number of acres, any specific location(s), or a specific Salton Sea elevation.

State Water Resources Control Board Order

As a responsible agency for the IID Water Conservation and Transfer Project, the State Water Resources Control Board (SWRCB) acknowledged and accepted the incremental implementation of the four-step air quality plan to mitigate potential air quality impacts from the exposed playa through SWRCB Order 2002-0013). To develop an adequate baseline, the SWRCB Order requires that Step 2 of the plan, research and monitoring, be implemented within 6 months of the effective date of the approval – December 20, 2002. Further, the SWRCB Order stated that ICAPCD and SCAQMD have jurisdiction over different parts of the Salton Sea geographical region. The SWRCB Order delegated to the Chief of the Division of Water Rights the authority to determine, in consultation with ICAPCD, SCAQMD, and CARB, whether any mitigation measure identified as part of the four-step plan is feasible. With implementation of the feasible mitigation measures, the SWRCB stated that they believe that the impacts to air quality due to exposed shoreline would be less than significant. Nonetheless, the Final EIS/EIR states that dust emissions from shoreline exposure are a potentially significant, unavoidable impact. The SWRCB Order concludes that IID could mitigate the air quality impacts to less-than-significant levels. However, to the extent that impacts are unmitigable and unavoidable, the SWRCB found that the critical importance of a reliable Colorado River water supply outweighs the impacts. The SWRCB Order also specified that IID must comply with all applicable requirements of ICAPCD's and SCAQMD's SIPs and PM_{10} rules.

Adoption and Implementation of Air Quality Management Plans and State Implementation Plans

Under existing conditions, ambient air quality standards for several air pollutants are not being achieved in portions of the Salton Sea watershed, as presented earlier in this chapter. In the Salton Sea Air Basin, the air pollutants of greatest concern are O_3 and the O_3 precursors, NO_x, VOCs, and PM_{10}. O_3 and O_3precursors are primarily generated from vehicle and equipment exhaust. PM_{10} is generated primarily from soil disturbance and wind erosion (fugitive dust). Agricultural operations and transport of pollutants from Mexico also affect air quality in the area.

For areas not meeting standards, the responsible air districts must prepare plans with control measures sufficient to attain national standards by predetermined attainment dates. Once standards are achieved, plans are required to ensure compliance with standards is maintained. Air quality agencies must quantify emissions from existing sources and forecast future emissions to support development of AQMPs and

SIPs. These plans must be consistent with population forecasts and growth assumptions in the applicable county and local general plans.

As noted previously, under the No Action Alternative, emissions from playa under the baseline for the IID Water Conservation and Transfer Project (to -235 feet mean sea level [msl]), plus emissions from the playa exposed due to projects approved after the QSA approval, would not fall under the State of California's QSA-related mitigation responsibilities. These uncontrolled emissions would be the responsibility of the landowners, and may add to air quality issues in the Salton Sea Air Basin. As a result, the AQMPs and SIPs under development would need to include these emissions in the emissions inventories used to support attainment planning in the future. This analysis of air quality conditions under the No Action Alternative assumes that SIPs will be developed and implemented to evaluate and control significant emission sources. It is further assumed that local jurisdictions will be in compliance with their SIPs and that the air basins within the study area will reach attainment for the applicable standards by the legislated deadlines.

Among air pollutants, PM_{10} is a possible exception to the general assumption of long-term attainment. While it is subject to the SIP process, fugitive windblown dust emissions from vacant lands pose challenges. Unlike concentrated pollutant sources that are more readily identified and controlled, fugitive dust emissions are difficult to detect, locate, regulate, and control. However, it is anticipated that the SIP process will reduce PM concentrations to lower levels, and maintain these levels, by identifying and addressing significant PM sources.

Note that forecasts of future air quality conditions under the No Action Alternative rely upon available air quality planning documents, which typically have a planning horizon of about 5 to 20 years. The study period for the SCH Project is 75 years. While consistency with air quality planning documents is critical, they may have limited value when trying to predict actual air quality conditions in 75 years. In the absence of long-term air quality planning documents, the pollutants and emissions sources described above are expected to continue, and air emissions will very likely increase in the future, along with the forecasted population growth and increased development in the study area. Likewise, air quality planning documents may be expected to evolve as growth and development occur.

3.3.4.4 Description of the No Action Alternative

The No Action Alternative would involve construction and operations and maintenance activities for pupfish channels. Additionally, IID, as mitigation for the IID Water Conservation and Transfer Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at Salton Sea State Recreation Area, as well as boat launches along the shoreline.

Under the No Action Alternative, it is assumed that the IID Water Conservation and Transfer Project four-step air quality plan to identify and control emissions from the exposed playa resulting from the QSA projects would be implemented. Impacts on air quality resulting from the IID Water Conservation and Transfer Project (below -235 feet msl and above -248 feet msl) would be mitigated as described in the EIS/EIR.

Emissions from the playa exposed by projects approved before the IID Water Conservation and Transfer Project, plus emissions from the playa that may be exposed due to projects approved after the QSA approval (above -235 feet msl and below -248 feet msl), are not included in the analysis of impacts of the No Action Alternative, nor would they be included in the QSA-related air quality mitigation. These uncontrolled emissions would be the responsibility of the landowners, and may add to air quality issues in the Salton Sea Air Basin. It is assumed that the landowners would comply with all applicable air quality management requirements. The area that is the responsibility of the landowners is located above the

elevation of -235 feet msl. The area of exposed playa predicted to result from the IID Water Conservation and Transfer Project would be located between -235 feet msl and 248 feet msl.

The following analyses for air quality summarize impacts of facility construction, facility operations and maintenance, fugitive dust emissions associated with exposed playa areas, odorous emissions, and microclimate.

Construction-Related Emissions

Construction of components in the No Action Alternative would result in air emissions such as fugitive dust, and exhaust from the combustion of fossil fuels in equipment and vehicles. Fugitive dust emissions (PM_{10}) from construction were estimated for activities that would disturb dry land and for truck travel on unpaved roadways. Impacts associated with fugitive dust from construction of the components in the No Action Alternative would be greater than under existing conditions. However, as estimated in the PEIR, fugitive dust emissions from construction of components would not exceed the local significance threshold for PM_{10} from construction, 150 pounds/day, nor would they exceed the annual threshold, 70 tons/year. Construction fugitive dust emissions would lessen over time, as components are completed.

NO_x and diesel PM_{10} emissions rates were estimated for exhaust from construction equipment (such as bulldozers and excavators) and diesel-fueled trucks. Impacts associated with NO_x and diesel PM_{10} emissions from construction of the components in the No Action Alternative would be greater than emissions under existing conditions. However, the NO_x emissions would be below the applicable local significance thresholds, 100 pounds/day or 50 tons/year.

Operations and Maintenance-Related Emissions

Operations and maintenance activities have the potential to contribute air emissions such as fugitive dust and exhaust from the combustion of fossil fuels in equipment and vehicles. Emissions were estimated for activities used to operate and maintain the components, such as canals.

Impacts associated with fugitive dust emissions from operations and maintenance of the components in the No Action Alternative would be greater than impacts under existing conditions. PM_{10} emissions associated with operations and maintenance would be below the applicable local significance thresholds, 150 pounds/day or 70 tons/year.

Impacts associated with NO_x emissions from operations and maintenance of the components in the No Action Alternative would be greater than impacts under existing conditions. The NO_x emissions would be below the applicable local significance thresholds, 55 pounds/day or 50 tons/year.

Impacts associated with fugitive dust from exposed playa in the No Action Alternative would be greater than impacts under existing conditions. Fugitive dust emissions from exposed playa in the near future are not predicted to exceed the local significance thresholds for PM_{10}, 150 pounds/day or 70 tons/year. However, these types of emissions are predicted to continue in later years, and would become even more significant over time, as greater areas of playa are exposed. Even with the implementation of an aggressive air quality management program for dust control, fugitive dust emissions from exposed playa is predicted to eventually exceed the local significance thresholds.

Odorous Emissions

In earlier phases, the No Action Alternative would not be greatly different than existing conditions, with regard to water column stratification and buildup of hydrogen sulfide, ammonia, and other eutrophication by-products that may be released during mixing events. In later phases, the No Action Alternative would result in shallower water bodies, slightly better mixing, and reduction in the amount of anoxic water

produced. In addition, when fish are no longer present in the Salton Sea, odor impacts associated with stratification, followed by summer and fall mixing, would be less than impacts under existing conditions.

Microclimate

Several meteorological and physical parameters have been found to have effects on the weather and climate in the area near a large body of water. These localized effects are referred to as the local microclimate. The microclimate of an area includes evapotranspiration, relative humidity, temperature, precipitable water, rainfall, wind speed and direction, vegetation, and the interaction of these parameters.

Under the No Action Alternative, shallower depths, smaller water surfaces, and higher salinity would affect all of the microclimate parameters near the existing shoreline and, in particular, evapotranspiration. Also, changes in vegetation would likely result from the construction of components and dust control measures. Changes in vegetative cover would also affect evapotranspiration. Existing native and agricultural vegetation immediately adjacent to the existing Salton Sea may also be affected.

By reducing water surfaces, less water is available for microclimatic interactions in the atmosphere. The change in interaction between the water surface and sunlight would result in changes to the microclimate parameters, including reductions in relative humidity, evapotranspiration, precipitable water, and rainfall.

Temperature effects would vary because water acts as an insulator, and reduced inflow results in less water to cover the ground. Dry ground absorbs heat from sunlight faster than water surfaces, thereby increasing air temperatures during daylight hours. Because the ground does not insulate as well as water, temperatures would drop faster at night, resulting in larger diurnal temperature swings, with higher temperatures during the day and potentially lower temperatures at night.

Vegetation would increase under the alternatives in areas where plants are used in air quality management, or where native vegetation or agricultural crops are encouraged to grow. However, native vegetation in some areas immediately adjacent to the Salton Sea may decrease, because less moisture would be available to sustain plant growth.

The No Action Alternative would have an undetermined effect on wind speed and direction. In some cases, wind speed would be reduced in areas where more vegetation is planted. Conversely, wind speed would increase in areas where existing vegetation dies due to decreased water or water vapor availability. As changes in total surface area occur, the local wind patterns could change significantly if the lake breeze circulation is weakened or is no longer driven by the differential heating of the land surface and water surface.

3.3.4.5 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Construction emissions for each of the Project alternatives are summarized in Tables 3.3-12 to 3.3-15. The calculations assume the implementation of measures required by ICAPCD (2007) to reduce emissions from diesel-powered equipment and vehicles and fugitive dust.

Impact AQ-1: Emissions from Project construction and maintenance are accounted for in applicable air quality plans and would not conflict with or obstruct their implementation (less-than-significant impact). The Project would not conflict with the air quality plans adopted by ICAPCD identified in the above *Imperial County Attainment Status and Applicable Plans* under Section 3.3.4.5 because construction-related emissions (i.e., temporary sources) are accounted for in the emission inventories included in the plans. Similarly, operational emissions would be limited to annual maintenance earthmoving and associated vehicular traffic, which is essentially small-scale reconstruction. Because general estimated Basinwide construction-related emissions are included in ICAPCD's emission

inventories (which, in part, form the basis for the air quality plans cited in under *Imperial County Attainment Status and Applicable Plans*), and because all required emissions reduction measures would be implemented, Project construction activities would not prevent attainment or maintenance of state or Federal O_3 or particulate matter standards within the Salton Sea Air Basin. The Project also would not increase population or vehicle miles traveled beyond projections in local plans. In addition, the Project would not result in the operation of any stationary emissions sources or long-term operation of area or mobile emission sources. Therefore, impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact AQ-2: The SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust (beneficial impact). The SCH ponds would cover more playa than would otherwise be exposed as a result of the No Action Alternative throughout the duration of the Project (refer to Section 3.11, Hydrology and Water Quality for additional discussion). By 2077, although Alternative 1 would result in a smaller remnant Sea, the net effect of the alternative would be to cover an additional 940 acres of playa. Thus, the ponds would reduce fugitive dust emissions around the Salton Sea by covering otherwise exposed playa with water. Requirements to reduce PM_{10} emissions, including fugitive dust emissions at the Salton Sea resulting from actions that are part of the No Action Alternative, are included in the *2009 Imperial County State Implementation Plan for Particulate Matter Less than 10 Microns in Aerodynamic Diameter* (ICAPCD 2009). The Project would be consistent with this plan because more area would be covered than exposed, which would be a beneficial impact when compared to both the existing environmental setting and the No Action Alternative.

Impact AQ-3a: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X and PM_{10} thresholds during construction (significant impact). No ambient air quality violations would occur solely due to Project emissions for any pollutant, although the Project would incrementally contribute to existing violations of state and Federal air quality standards for O_3, PM_{10}, and $PM_{2.5}$ during construction (Tables 3.3-12, 3.3-13, and 3.3-14). These contributions would occur primarily through diesel engine exhaust and fugitive dust emissions during construction activities. Peak daily NO_X and fugitive PM_{10} emissions from on- and off-site sources during construction would exceed ICAPCD's thresholds, which would be a significant impact when compared to both the existing environmental setting and the No Action Alternative.

Table 3.3-12 Estimated Maximum Daily Construction Emissions for Project Alternatives (with Required Controls)

Criteria Emissions	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
	lb/day	significant	lb/day	significant	lb/day	significant	lb/day	significant	lb/day	significant	lb/day	significant
Volatile Organic Compounds (VOC as CH_4)	18	No	14	No	21	No	11	No	11	No	13	No
Carbon Monoxide (CO)	77	No	62	No	93	No	38	No	38	No	40	No
Oxides of Nitrogen (NO_X as NO_2)	207	**Yes**	165	**Yes**	248	**Yes**	121	**Yes**	121	**Yes**	121	**Yes**
Sulfur Dioxide (SO_X as SO_2)	0.3	No	0.3	No	0.4	No	0.1	No	0.1	No	0.2	No
Combustion Particulates (C-PM_{10})	10.1	No	8.1	No	12.2	No	4.1	No	3.7	No	4.9	No
Combustion Particulates (C-$PM_{2.5}$)	8.7	No	6.9	No	10.4	No	3.5	No	3.4	No	4.2	No
Fugitive Dust (F-PM_{10})	194	**Yes**	155	**Yes**	169	**Yes**	58	No	61	No	81	No
Fugitive Dust (F-$PM_{2.5}$)	36	No	29	No	38	No	13	No	12	No	17	No

Sources: SCAQMD 1993, updated in 2008; USEPA 2006, updated in 2011; USEPA 2010

Notes:

Daily maximums do not include importing equipment from other areas in state (local emissions only)

Fugitive dust and combustion particulates are determined separately

Table 3.3-13 Estimated Maximum Daily Construction Fugitive Dust Emissions for Project Alternatives (with Required Controls)

Fugitive Dust Emissions	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
	lb/day	significant	lb/day	significant	lb/day	significant	lb/day	significant	lb/day	significant	lb/day	significant
Fugitive Dust ($F\text{-}PM_{10}$) - All Onsites	1.5	No	1.5	No	1.8	No	1.3	No	1.3	No	1.5	No
Fugitive Dust ($F\text{-}PM_{10}$) - All Offsites	192	**Yes**	154	**Yes**	167	**Yes**	57	No	60	No	80	No
Fugitive Dust ($F\text{-}PM_{10}$) - All Combined Totals	194	**Yes**	155	**Yes**	169	**Yes**	58	No	61	No	81	No
Fugitive Dust ($F\text{-}PM_{2.5}$) - All Onsites	0.4	No	0.4	No	0.5	No	0.3	No	0.3	No	0.4	No
Fugitive Dust ($F\text{-}PM_{2.5}$) - All Offsites	35	No	28	No	38	No	13	No	12	No	16	No
Fugitive Dust ($F\text{-}PM_{2.5}$) - All Combined Totals	36	No	29	No	38	No	13	No	12	No	17	No

Sources: USEPA 2006, updated in 2011; USEPA 2010

Notes:

Daily maximums do not include importing equipment from other areas in state (local emissions only)

Fugitive dust and combustion particulates are determined separately

Table 3.3-14 Estimated Total Construction Emissions for Project Alternatives (with Required Controls) (2 Years)

Criteria Emissions	Alternative 1 tons	Alternative 2 tons	Alternative 3 tons	Alternative 4 tons	Alternative 5 tons	Alternative 6 tons
Volatile Organic Compounds (VOCs as CH4)	5.5	4.5	6.2	3.3	2.9	3.8
Carbon Monoxide (CO)	19.6	16.1	22.2	11.8	10.4	13.4
Oxides of Nitrogen (NOX as NO2)	48.4	40.3	55.1	29.3	26.3	33.6
Sulfur Dioxide (SOX as SO2)	0.1	0.1	0.1	0.0	0.0	0.0
Combustion Particulates (C-PM10)	1.9	1.6	2.2	1.1	1.0	1.3
Combustion Particulates (C-PM2.5)	1.8	1.4	2.0	1.0	0.9	1.2
Fugitive Dust (F-PM10)	5.1	4.3	4.8	1.7	1.8	2.0
Fugitive Dust (F-PM2.5)	0.9	0.8	1.0	0.4	0.3	0.4

Sources: SCAQMD 1993, updated in 2008; USEPA 2006, updated in 2011; USEPA 2010
Notes:
Totals include importing equipment from other areas in state
Fugitive dust and combustion particulates are determined separately

Table 3.3-15 Estimated Operational Emissions for Project Alternatives (with Required Controls)

Criteria Emissions	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5		Alternative 6	
	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr	lb/day	tons/yr
Volatile Organic Compounds (VOCs as CH_4)	2.4	0.10	2.4	0.10	2.4	0.11	2.4	0.09	2.4	0.09	2.4	0.09
Carbon Monoxide (CO)	8.9	0.46	8.9	0.45	8.9	0.49	8.9	0.40	8.9	0.40	8.9	0.42
Oxides of Nitrogen (NO_X as NO_2)	20.5	0.74	20.5	0.73	20.5	0.81	20.5	0.64	20.5	0.64	20.5	0.68
Sulfur Dioxide (SO_X as SO_2)	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Combustion Particulates (C-PM_{10})	0.8	0.04	0.8	0.04	0.8	0.04	0.8	0.03	0.8	0.03	0.8	0.03
Combustion Particulates (C-$PM_{2.5}$)	0.7	0.03	0.7	0.03	0.7	0.04	0.7	0.03	0.7	0.03	0.7	0.03
Fugitive Dust (F-PM_{10})	5.1	0.12	5.1	0.12	4.4	0.12	4.4	0.10	4.7	0.10	4.7	0.11
Fugitive Dust (F-$PM_{2.5}$)	0.8	0.02	0.8	0.02	0.8	0.02	0.8	0.02	0.8	0.02	0.8	0.02

Sources: SCAQMD 1993, updated in 2008; USEPA 2006, updated in 2011; USEPA 2010

Notes:

Fugitive dust and combustion particulates are determined separately

Mitigation Measures

The SCH Project would be required to comply with ICAPCD'**s** Regulation VIII, Fugitive Dust Control Measures (Appendix G), but the following additional measures would be implemented to further minimize impacts from NO_x and PM_{10} emissions.

MM AQ-1: Implement fugitive PM_{10} control measures. The following measures will be incorporated into the construction contract specifications in order to reduce PM_{10} emissions from fugitive dust, in addition to those measures that are required for all projects by the ICAPCD:

- Water exposed soil with adequate frequency for continued moist soil (at least twice daily and indicated by soil and air conditions).
- Replace ground cover in disturbed areas as quickly as possible.
- Limit vehicle speed for all construction vehicles to 15 miles per hour on any unpaved surface at the construction site.
- Develop a trip reduction plan to achieve a 1.5 average vehicle ridership for construction employees.

MM AQ-2: Implement diesel control measures. The following measures will be incorporated into the construction contract specifications in order to reduce PM_{10} and NO_x emissions from diesel engines, in addition to those measures that are required for all projects by the ICAPCD:

- A schedule of low-emissions tune-ups will be developed and such tune-ups will be performed on all equipment, particularly for haul and delivery trucks.
- Low-sulfur (≤ 15 ppmw S) fuels will be used in all stationary and mobile equipment.
- Curtail construction during periods of high ambient pollutant concentrations as directed by the ICAPCD.

Reschedule activities to reduce short-term impacts to the extent feasible.

Residual Impact

Implementation of the mitigation measures described above would reduce the PM_{10} and NO_X impacts, but they would not be sufficient to reduce impacts to below the applicable thresholds; thus, the impact would be significant and unavoidable.

Impact AQ-4: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards during operations but would not exceed any regulatory thresholds (less-than-significant impact). As shown in Table 3.3-15, operational emissions would be limited to routine maintenance and associated vehicular traffic and would not exceed ICAPCD's thresholds.

Impact AQ-5: Project construction would result in a cumulatively considerable/significant net increase in emissions (significant impact). As shown in Tables 3.3-12 and 3.3-15, NO_X and PM_{10} emissions during construction would exceed regulatory thresholds and should other projects considered in the cumulative impact analysis be under construction at the same time, also emitting NO_X and PM_{10}, the cumulative impact would be significant, and the Project's contribution would be cumulatively considerable/significant. Emissions from operations would not be cumulatively considerable/significant because they would be mobile, intermittent, and minor.

Mitigation Measures

All projects would be required to comply with the ICAPCD's Regulation VIII, which is not mitigation per se, but which would minimize PM_{10} emissions. MM AQ-1 and MM AQ-2 would reduce the Project's

contribution to the significant cumulative impact, and other projects would be required to implement similar measures should their emissions exceed regulatory thresholds.

Residual Impacts

MM AQ-1 and MM AQ-2 would reduce the SCH Project's PM_{10} emissions to below the regulatory threshold; given the implementation of these measures, the Project's contribution to the cumulative impact would not be considerable, and the residual impact would be less than significant. Implementation of MM AQ-2 would reduce the SCH Project's contribution to the NO_X impact, but the regulatory threshold would be exceeded, and the residual impact would be significant.

Impact AQ-6: Project emissions from construction and maintenance would not expose sensitive receptors to substantial pollutant concentrations (less-than-significant impact). DPM contains substances that are suspected carcinogens, along with pulmonary irritants and hazardous compounds that may affect sensitive receptors such as young children, senior citizens, or those susceptible to respiratory disease. Where construction activity occurs in proximity to long-term sensitive receptors, a potential exists for unhealthful exposure of those receptors to diesel exhaust, including residential receptors. The Project sites are located in a sparsely populated agricultural area, and no houses, parks, schools, libraries, senior facilities, day care centers, or hospitals are located within 1,000 feet of the potential construction sites. Similarly, the access routes are in agricultural areas, although isolated farmhouses are present at some locations. It is assumed that delivery of rock and gravel would produce a maximum of 150 tractor trailer round-trips per day for an approximately 2- to 3-month period. Delivery of equipment and materials like pipe to the Project site from more distant locations would require a maximum of 187 round-trips total over the 2 year construction period, which is the equivalent of approximately one long-distance trip every 2.5 days. The access roads are very lightly traveled (refer to Section 3.20, Transportation and Traffic) (well below their design capacity), and the addition of intermittent trips during construction would not expose sensitive receptors to health risks. Therefore, due to relatively low mass emissions, dispersion over a wide geographic area, lack of proximate receptors, and short timeframe (2 years), impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative. Additionally, implementation of the control measures for diesel exhaust described in MMs AQ-1 and AQ-3 would further reduce any potential impacts associated with DPM.

Maintenance activities would emit far less DPM than construction and would also be less than significant.

Impact AQ-7: The Project could result in localized odors during construction, operations, and maintenance (less-than-significant impact). California ultralow sulfur diesel fuel with a maximum sulfur content of 15 ppm by weight would be required to be used in all diesel-powered equipment, which would minimize emissions of sulfurous gases (SO_2, hydrogen sulfide, carbon disulfide, and carbonyl sulfide). Excavation of anoxic sediments is not expected to produce odors, but should they occur, the odors would dissipate rapidly, and given the remote location, would not affect a substantial number of people. A potential exists for fish and bird die-offs to occur periodically during pond operations, which could result in odors. The ponds would be monitored, and dead birds would be removed by the California Department of Fish and Game, so odors would not develop. Should fish die-offs occur, birds would likely eat smaller fish (3 inches or less) quickly. Odors might occur while larger fish decomposed, but the New River sites are not located in an inhabited area, and any impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact AQ-8: The Project would have a minor effect on the microclimate near the Salton Sea (less-than-significant impact). In the near term, the Project would not result in a change in microclimate because the SCH ponds would be constructed as the shoreline recedes and would replace waters recently contained within the Sea with water confined in ponds. As the Sea recedes, as described under the No Action Alternative, the microclimate is expected to change. The SCH Project would temper the changes

somewhat because it would replace a portion of what otherwise would be exposed playa with water-filled ponds. Any changes would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

3.3.4.6 Alternative 2 – New River, Pumped Diversion

Impact AQ-1: Emissions from Project construction and maintenance are accounted for in applicable air quality plans and would not conflict with or obstruct their implementation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-2: The SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although by 2077, the net effect would be to cover an additional 790 acres of playa, rather than 940 acres.

Impact AQ-3a: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X and PM_{10} thresholds during construction (significant impact). The discussion under Alternative 1 is applicable to this alternative. MM AQ-1 and MM AQ-2 are applicable to this alternative, and the residual impact would remain significant.

Impact AQ-4: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards during operations but would not exceed any regulatory thresholds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-5: Project construction would result in a cumulatively considerable/significant net increase in emissions (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-6: Project emissions from construction and maintenance would not expose sensitive receptors to substantial pollutant concentrations (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-7: The Project could result in localized odors during construction, operations, and maintenance (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-8: The Project would have a minor effect on the microclimate near the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.3.4.7 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact AQ-1: Emissions from Project construction and maintenance are accounted for in applicable air quality plans and would not conflict with or obstruct their implementation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-2: The SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although by 2077, the net effect would be to cover an additional 1,150 acres of playa, rather than 940 acres.

Impact AQ-3a: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X and PM_{10} thresholds during construction

(significant impact). The discussion under Alternative 1 is applicable to this alternative. MM AQ-1 and MM AQ-2 are applicable to this alternative, and the residual impact would remain significant.

Impact AQ-4: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards during operations but would not exceed any regulatory thresholds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-5: Project construction would result in a cumulatively considerable/significant net increase in emissions (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-6: Project emissions from construction and maintenance would not expose sensitive receptors to substantial pollutant concentrations (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-7: The Project could result in localized odors during construction, operations, and maintenance (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-8: The Project would have a minor effect on the microclimate near the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.3.4.8 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact AQ-1: Emissions from Project construction and maintenance are accounted for in applicable air quality plans and would not conflict with or obstruct their implementation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-2: The SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although by 2077, the net effect would be to cover an additional 194 acres of playa, rather than 940 acres.

Impact AQ-3b: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X threshold during construction (significant impact). The discussion under Alternative 1 is generally applicable to this alternative, except that the PM_{10} threshold would not be exceeded. MM AQ-2 is applicable to this alternative, and the residual impact would remain significant.

Impact AQ-4: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards during operations but would not exceed any regulatory thresholds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-5: Project construction would result in a cumulatively considerable/significant net increase in emissions (significant impact). The discussion under Alternative 1 is applicable to this alternative, except the increase in PM_{10} emissions would not be cumulatively considerable/significant.

Impact AQ-6: Project emissions from construction and maintenance would not expose sensitive receptors to substantial pollutant concentrations (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, with the exception that additional sensitive receptors are located at Red Hill Park. A number of seasonal residents live in recreational vehicles at the park, and tent campers may be present, as well. The inhabited area is on the north side of the park, close to where the

saline pump and pipeline would be located. Their installation would proceed rapidly, and construction equipment would only work within 1,000 feet of the residents for a limited time. This would not be enough to result in an increased health risk, and impacts would remain less than significant when compared to both the existing environmental setting and No Action Alternative.

Impact AQ-7: The Project could result in localized odors during construction, operations, and maintenance (less-than-significant impact). The discussions under Alternatives 1 and 3 are applicable to this alternative.

Impact AQ-8: The Project would have a minor effect on the microclimate near the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.3.4.9 Alternative 5 – Alamo River, Pumped Diversion

Impact AQ-1: Emissions from Project construction and maintenance are accounted for in applicable air quality plans and would not conflict with or obstruct their implementation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-2: The SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although by 2077, the net effect would be to cover an additional 600 acres of playa, rather than 940 acres.

Impact AQ-3b: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X threshold during construction (significant impact). The discussion under Alternative 1 is generally applicable to this alternative, except that the PM_{10} threshold would not be exceeded. MM AQ-2 is applicable to this alternative, and the residual impact would remain significant.

Impact AQ-4: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards during operations but would not exceed any regulatory thresholds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although emissions would be greater because more construction would occur.

Impact AQ-5: Project construction would result in a cumulatively considerable/significant net increase in NO_X and PM_{10} emissions (significant impact). The discussion under Alternative 1 is applicable to this alternative, except the increase in PM_{10} emissions would not be cumulatively considerable/significant.

Impact AQ-6: Project emissions from construction and maintenance not expose sensitive receptors to substantial pollutant concentrations (less-than-significant impact). The discussion under Alternative 1 and 4 are applicable to this alternative, although only the pipeline would be in proximity to Red Hill Park.

Impact AQ-7: The Project could result in localized odors during construction, operations, and maintenance (less-than-significant impact). The discussions under Alternatives 1 and 3 are applicable to this alternative.

Impact AQ-8: The Project would have a minor effect on the microclimate near the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.3.4.10 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact AQ-1: Emissions from Project construction and maintenance are accounted for in applicable air quality plans and would not conflict with or obstruct their implementation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-2: The SCH ponds would cover more playa than would be exposed as a result of the Project, reducing the potential for wind-blown fugitive dust (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although by 2077, the net effect would be to cover an additional 880 acres of playa, rather than 940 acres, although only an additional 46 acres would be exposed by 2077.

Impact AQ-3b: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards and exceed ICAPCD's NO_X threshold during construction (significant impact). The discussion under Alternative 1 is generally applicable to this alternative, except that the PM_{10} threshold would not be exceeded. MM AQ-2 is applicable to this alternative, and the residual impact would remain significant.

Impact AQ-4: The Project would contribute incrementally to violations of Federal and state O_3, PM_{10}, and $PM_{2.5}$ standards during operations but would not exceed any regulatory thresholds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact AQ-5: Project construction would result in a cumulatively considerable/significant net increase in NO_X and PM_{10} emissions (significant impact). The discussion under Alternative 1 is applicable to this alternative, except the increase in PM_{10} emissions would not be cumulatively/significant considerable.

Impact AQ-6: Project emissions from construction and maintenance would not expose sensitive receptors to substantial pollutant concentrations (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative; construction would not occur within 1,000 feet of the residents at Red Hill Park.

Impact AQ-7: The Project could result in localized odors during construction, operations, and maintenance (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

Impact AQ-8: The Project would have a minor effect on the microclimate near the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.3.5 General Conformity

Under section 176(c)(1) of the Federal CAA, Federal agencies that "engage in, support in any way or provide financial assistance for, license or permit, or approve any activity"[9] must demonstrate that such actions do not interfere with state and local plans to bring an area into attainment with the NAAQS. Imperial County is designated nonattainment for the Federal 8-hour ozone NAAQS, while the Imperial Valley (which is the Salton Sea Air Basin's Imperial County portion) is designated as nonattainment area for 24-hour Federal PM_{10} and $PM_{2.5}$. The program by which a Federal agency determines that its action would not obstruct or conflict with air quality attainment plans is called "General Conformity." The implementing regulations for General Conformity are found in 40 CFR part 93, subpart B.[10]

[9] 42 USC section 7506(c)
[10] General conformity regulations were recently amended effective July 6, 2010. (75 FR 17254 (April 5, 2010))

Under the General Conformity regulations, both the direct and indirect emissions associated with a Federal action must be evaluated. 40 CFR part 93, subpart B defines direct emissions as:

> [T]hose emissions of a criteria pollutant or its precursors that are caused or initiated by the Federal action and originate in a nonattainment or maintenance area and occur at the same time and place as the action and are reasonably foreseeable.[11]

Indirect emissions are defined as:

> [T]hose emissions of a criteria pollutant or its precursors:
>
> 1. That are caused or initiated by the Federal action and originate in the same [Federal] nonattainment or maintenance area, but occur at a different time or place as the action;
> 2. That are reasonably foreseeable;
> 3. That the agency can practically control; and
> 4. For which the agency has continuing program responsibility.

For purposes of this definition, even if a Federal licensing, rulemaking, or other approving action is a required initial step for a subsequent activity that causes emissions, such initial steps do not mean that a Federal agency can practically control any resulting emissions.[12]

When describing the 2010 revisions to the definition of indirect emissions, USEPA offered the following explanation:

> EPA is revising the definition for indirect emissions to clarify that only indirect emissions originating in a nonattainment or maintenance area need to be analyzed for conformity with the applicable SIP. In addition EPA is revision the definition of “indirect emissions” to clarify what is meant by “the agency can practically control” and “for which the agency has continuing program responsibility.” This clarification represents EPA's long standing position that Congress did not intend for conformity to apply to “cases where although licensing or approving action is a required initial step for a subsequent activity that causes emissions, the agency has no control over that subsequent activity, either because there is no continuing program responsibility or ability to practically control.”[13]

The 2010 revisions to the definition of "indirect emissions" are consistent with the preamble to the 1993 General Conformity Rule, which explicitly defined and limited the responsibilities of the Corps with regard to non-Federal activities needing Corps permit authorization. In essence, the Corps is not legally required to document, analyze, and seek mitigation measures for any indirect emissions of actions requiring Corps permit authorization, since it would not be practicable for the Corps to control such emissions; and, frequently, the Corps would not have a continuing program responsibility to maintain control over them.

As explained in the 1993 preamble:

> The EPA does not believe that it is reasonable to conclude that a Federal agency ‘supports’ an activity by third persons over whom the agency has no practicable control – or 'supports' emissions over which the agency has no practicable control – based on the

[11] 40 CFR section 93.152 (as revised April 5, 2010, effective July 6, 2010; 75 FR 17273)
[12] 40 CFR section 93.152 (as revised April 5, 2010, effective July 6, 2010; 75 FR 17273)
[13] 75 FR 17260 (April 5, 2010) (citations omitted)

> mere fact that, if one inspects the 'causal' chain of events, the activity or emissions can be described as being a 'reasonably foreseeable' result of the agency's actions.[14]

USEPA explained in the 1993 preamble that "the person's (i.e., permit applicant's) activities that fall outside of the Federal agency's continuing program responsibility to control are subject to control by state and local agencies."[15] Therefore, the Corps does not have a continuing program responsibility to measure, monitor, control, or mitigate for air emissions that may result from the construction or operation of a non-Corps facility, even though some part, portion, or phase of that facility requires a permit from the Corps. Under the CAA, the state and local clean air agencies have full responsibility and authority to address those emissions, and to prevent or condition the construction of the non-Federal facility as necessary to deal with those air emissions.

USEPA also stated its belief "that Congress did not intend the General Conformity rule to affect innumerable Federal actions, impose analytical requirements on activities that are very minor in terms of Federal involvement and air quality impacts, and result in significant expense and delay."[16]

The preamble to the 1993 General Conformity Rule provided an explicit example that defines the Corps' responsibility and shows a close relationship between the definition of Federal action and the restrictive language from the definition of indirect emission as follows:

> Assume for example, that the Corps issues a permit and that permitted fill activity represents one phase of a larger non-Federal undertaking; i.e., the construction of an office building by a non-Federal entity. Under the conformity rule, the Corps would be responsible for addressing all emissions from that one phase of the overall office development undertaking that the Corps permit; i.e., the fill activity at the wetland site. However, the Corps is not responsible for evaluating all emissions from later phases of the overall office development (the construction, operation, and use of the office building itself), because later phases generally are not within the Corps continuing program responsibility and generally cannot be practicably controlled by the Corps.[17]

In addition, the approach taken in the EIS/EIR is consistent with the Corps' guidance memorandum regarding implementation of the General Conformity Rule:

> [G]enerally, speaking the Corps does not have a continuing program responsibility to measure, monitor, control, or mitigate for air emissions that may result from the construction or operation of a non-Corps facility (such as a shopping center, factory, or non-Federal port), even though some part, portion, or phase of that facility requires a permit from the Corps. Under the CAA, the state and local clean air authorities have full responsibility and authority to deal with those emissions, and to prevent or condition the construction of the non-Federal facility as necessary to deal with those air emissions.[18]

Since the Corps would not be responsible for ongoing long-term operation and maintenance of the habitat area (i.e., it would not have continuing program responsibility), neither directly through actions nor

[14] 58 FR 63220 (Nov 30, 1993)
[15] 58 FR 63222 (Nov 30, 1993)
[16] 58 FR 63219 (Nov 30, 1993)
[17] 58 FR 63227 (Nov 30, 1993)
[18] U.S. Army Corps of Engineers, Memorandum For All Major Subordinate Commanders, and District Commanders, Subject: USEPA's Clean Air Act (CAA) General Conformity Rule, from Lester Edelman, Chief Counsel, Corps (CECC-E) (April 20, 1994)

indirectly through funding, General Conformity would not apply after completion of the initial construction project.

The General Conformity regulations incorporate a stepwise process, beginning with an applicability analysis. According to USEPA guidance (USEPA 1994), before any approval is given for a Federal action to go forward, the regulating Federal agency must apply the applicability requirements found at 40 CFR section 93.153, subdivision (b) to the Federal action to evaluate whether, on a pollutant-by-pollutant basis, a determination of General Conformity is required. The guidance states that the applicability analysis can be (but is not required to be) completed concurrently with the NEPA analysis. If the regulating Federal agency determines that the General Conformity regulations do not apply to the Federal action, no further analysis or documentation is required. If the General Conformity regulations do apply to the Federal action, the regulating Federal agency must next conduct a conformity evaluation in accordance with the criteria and procedures in the implementing regulations, publish a draft determination of General Conformity for public review, and then publish the final determination of General Conformity.

A conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a Federal nonattainment or maintenance area would equal or exceed specified annual emission rates, referred to as "*de minimis*" thresholds." For ozone precursor and PM_{10}, the *de minimis* thresholds depend on the severity of the nonattainment classification. In an extreme ozone nonattainment area, the *de minimis* thresholds are 10 tons per year for both NO_x and VOC. In a serious PM_{10} nonattainment area, the *de minimis* threshold is 70 tons per year. For other pollutants, the threshold is set at 100 tons per year, as shown in Table 3.3-11.

The General Conformity regulations require that a General Conformity determination analyze the following emissions scenarios:

> (1) the attainment year specified in the SIP, or if the SIP does not specify an attainment year, the latest attainment year possible under the Act; or (2) the last year for which emissions are projected in the maintenance plan; (3) the year during which the total of direct and indirect emissions from the action is expected to be the greatest on an annual basis; and (4) any year for which the applicable SIP specifies an emissions budget (40 CFR section 93.159, subdivision (d), as amended, effective July 6, 2010).

On January 10, 2008 the USEPA made the finding that the Imperial Valley serious PM_{10} nonattainment area did not attain the 24-hour PM_{10} NAAQS by the December 31, 2001 deadline mandated in the CAA. In response to this finding, the State of California was required to submit a revision to the SIP that provided for attainment of the PM_{10} standard in the Imperial Valley area and at least 5 percent annual reductions in PM_{10} or PM_{10} precursor emissions until attainment as required by CAA section 189(d). The State was required to submit the SIP revision by December 11, 2008.[19]

On January 4, 2010 the USEPA determined that the Imperial County moderate 8-hour ozone nonattainment area had attained the 1997 8-hour NAAQS for ozone. This determination was based on certified ambient air monitoring data that showed monitored attainment of the 8-hour ozone NAAQS since the 2006 to 2008 monitoring period. In addition, quality controlled and quality assured ozone data for 2008 available in the USEPA Air Quality System database, but not yet certified at the time, showed that the area continued to attain the 1997 8-hour ozone NAAQS. The determination suspended the requirements for California to submit an attainment demonstration, a reasonable further progress plan, contingency measures, and other planning SIPs for the area related to attainment of the 8-hour ozone

[19] 72 FR 70222 (December 11, 2007)

NAAQS. These requirements remain suspended for so long as the area continues to attain the ozone NAAQS.[20]

As a result of these USEPA findings and determinations, there is no specific attainment year for PM_{10}, only annual increments of 5 percent reductions (these reductions constitute the emissions budget). Ozone is tentatively in attainment pending certification of 2008 monitoring data, until any future USEPA determination to the contrary. Thus, the year during which the total of direct and indirect emissions from the action is expected to be the greatest on an annual basis is the appropriate scenario for this analysis. This General Conformity determination is properly focused on emissions related to construction only, shown in Tables 3.3-16 and 3.3-17.

Table 3.3-16 Annual Construction Emissions Compared to General Conformity Thresholds for the SCH Project Alternatives (with Required Controls)

Criteria Emissions	Threshold	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Over Threshold
	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	
Volatile Organic Compounds (VOC as CH_4)	n/a[a]	2.7	2.3	3.1	1.7	1.5	1.9	n/a
Carbon Monoxide (CO)	100	9.8	8.1	11.1	5.9	5.2	6.7	No
Oxides of Nitrogen (NO_x as NO_2)	n/a[a]	24.2	20.2	27.5	14.6	13.2	16.8	n/a
Sulfur Dioxide (SO_x as SO_2)	100	0.0	0.0	0.0	0.0	0.0	0.0	No
Combustion Particulates (C-PM_{10})	70	1.0	0.8	1.1	0.6	0.5	0.6	No
Combustion Particulates (C-$PM_{2.5}$)	100	0.9	0.7	1.0	0.5	0.5	0.6	No
Fugitive Dust (F-PM_{10})	70	2.5	2.2	2.4	0.9	0.9	1.0	No
Fugitive Dust (F-$PM_{2.5}$)	100	0.5	0.4	0.5	0.2	0.2	0.2	No

Sources: SCAQMD 2008, USEPA 2006, USEPA 2010, 40 CFR sections 6, 51, & 93 (58 FR 63214)

Notes:

Volatile organic compounds and oxides of nitrogen are not applicable because Imperial County is not in serious, severe, or extreme nonattainment for this pollutant, and thresholds for such areas are the only ones that have been developed.

Totals include importing equipment from other areas in state

Fugitive dust and combustion particulates are determined separately

[20] 74 FR 63309 (December 3, 2009)

Table 3.3-17 Percentage of Construction Emissions from SCH Alternatives Compared to Regional Inventory (with Required Controls)

Criteria Emissions	Inventory	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Percent of Inventory
	tons/day	lb/day	lb/day	lb/day	lb/day	lb/day	lb/day	
Volatile Organic Compounds (VOC as CH_4)	48.1	18	14	21	11	11	13	0.015
Carbon Monoxide (CO)	176.2	77	62	93	38	38	40	0.016
Oxides of Nitrogen (NO_X as NO_2)	83.3	207	165	248	121	121	121	0.098
Sulfur Dioxide (SO_X as SO_2)	0.7	0.3	0.3	0.4	0.1	0.1	0.2	0.016
Combustion Particulates (C-PM_{10})	12.5	10.1	8.1	12.2	4.1	3.7	4.9	0.029
Combustion Particulates (C-$PM_{2.5}$)	10.8	8.7	6.9	10.4	3.5	3.4	4.2	0.029
Fugitive Dust (F-PM_{10})	238.4	194	155	169	58	61	81	0.025
Fugitive Dust (F-$PM_{2.5}$)	47.7	36	29	38	13	12	17	0.025

Sources: SCAQMD 2008, USEPA 2006, EPA 2010, CARB 2010e

Notes:

Daily maximums do not include importing equipment from other areas in state (local emissions only)

Inventory of combustion particulates and $PM_{2.5}$ approximated based on combined PM_{10} inventory

Percent of inventory is average across alternatives

Fugitive dust and combustion particulates are determined separately

Annual emissions for the six Project alternatives are compared to the General Conformity *de minimis* levels for NAAQS nonattainment areas. Annual emissions of NO_X, VOC, PM_{10}, and $PM_{2.5}$ for any alternative would be well below applicable General Conformity thresholds (i.e., moderate for ozone, serious for PM_{10}) and thus in conformance with the applicable SIPs. Daily emissions across alternatives would be well below 10 percent of the emission inventory and thus would not be regionally significant would be in conformance with the applicable SIPs. Based on these findings, the Corps finds that the Federal action, as designed, would conform to the approved SIPs for ozone and PM_{10}.

Annual emissions for the six Project alternatives were compared to the General Conformity *de minimis* levels for NAAQS nonattainment areas. Annual emissions of NO_X, VOC, PM_{10}, and $PM_{2.5}$ for each alternative would be well below applicable General Conformity thresholds (i.e., moderate for ozone, serious for PM_{10}) and thus in conformance with the SIPs. Daily emissions across alternatives would be well below 10 percent of the emission inventory, would not be regionally significant, and thus would be in conformance with the SIPs. Based on these findings, the Corps has determined that the Federal action, as designed, would conform to the approved SIPs for ozone and PM_{10}.

In addition, short-term direct construction emissions associated with the Project would not conflict with or obstruct implementation of applicable long-term air quality management plans. Therefore, the Project's impact with respect to the significance criterion: "Would the Project conflict with or obstruct implementation of an applicable air quality plan" would be less than significant.

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3.4 BIOLOGICAL RESOURCES

3.4.1 Introduction

The Salton Sea is located in an area that has a long history of dynamic changes; as a result of these changes, which have occurred over hundreds of thousands of years, the area has periodically provided aquatic habitat. The Salton Basin was once part of the Gulf of California, although it was isolated from the Gulf by sediment deposition from the Colorado River. The Salton Sea is in a basin that was flooded by the Colorado River for thousands of years (Brothers et al. 2009). From 1824 to 1906, Colorado River flows flooded the Salton Sea no fewer than eight times. Each time and countless times before, the Colorado River meandered northwest and filled the Basin with fresh water. Recorded floods include 1840, 1852, 1859, 1867, 1891, 1905, and 1906. The modern Salton Sea formed between 1904 and 1907 when repeated flooding along the Colorado River caused water diverted from the Colorado River for irrigation to break through a diversion headworks. The Sea was initially a freshwater lake, primarily sustained by inflows of agricultural drainwater, but over time it has become more saline than the ocean due to evaporation and lack of outflow. These changes in salinity have had a profound influence on the aquatic communities present. After the Sea formed, migratory birds began to use the Sea, and a number of species became resident. By 1908, fish were reported to be "plentiful–swarming by the hundreds" and the Sea supported nesting populations of herons, cormorants, and white pelicans (Grinnell 1908). Native plant communities in the Salton Sea area were profoundly affected by human activity, such as the conversion of the Imperial and Coachella valleys to agriculture and other uses. These activities not only eliminated vast areas of native vegetation, but also altered substrate and water regimes, and led to the introduction of nonnative plant species that have proliferated and now dominate most of the disturbed areas around the Salton Sea.

Salinity in the Salton Sea is expected to exceed the tolerance of most fish species currently present in the near future, thereby eliminating the food source for piscivorous (fish-eating) birds that use the Sea. How soon that will occur is unknown, but it could be within a few years to a decade or more. The Species Conservation Habitat (SCH) Project is designed to provide replacement for some of the near-term habitat losses that are expected to occur as surface water levels at the Sea decline and salinity increases. The biological resources analysis evaluates the effects of constructing and operating the Project alternatives on terrestrial (plant and animal) and aquatic organisms, including special-status species. Issues to be addressed include:

- Effects of construction as well as operations and maintenance activities on biological resources (special-status as well as common species, riparian and wetland habitats, and common native plant communities and wildlife);
- Potential for disease and toxicity effects (e.g., selenium and botulism);
- Habitat suitability (physical and chemical) for aquatic species;
- Aquatic habitat stability (physical, chemical, and biological) to provide adequate forage for piscivorous birds;
- Suitable habitat for bird resting, roosting, and nesting.

Table 3.4-1 summarizes the impacts of the six Project alternatives on biological resources, compared to both the existing conditions and the No Action Alternative.

Table 3.4-1 Summary of Impacts on Biological Resources

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact BIO-1a: Project construction and operation would affect habitat and individuals of desert pupfish and several special-status bird species.	Existing Condition	S	S	S	S	S	S	MM BIO-1: Prepare and implement a desert pupfish protection and relocation plan. MM BIO-2: Prepare and implement a preconstruction/ maintenance survey plan for bird species. MM BIO-3: Conduct noise measurements and implement noise attenuation measures, if needed. MM BIO-4: Design interception ditches to avoid alteration of water levels in adjacent marshes.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact BIO-1b: Project construction and operation would have minor effects on habitat and individuals of several special-status bird and mammal species.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact BIO-1c: Project operation would provide habitat for desert pupfish and several special-status bird species.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact BIO-2: Project construction and operation would cause a temporary disturbance or loss of riparian habitat and/or sensitive habitat.	Existing Condition	S	S	S	S	S	S	MM BIO-5: Prepare and implement a Habitat Protection, Mitigation, and Restoration Program.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact BIO-3a: Project construction would result in temporary disturbance of Federal Waters of the U.S. and minimal effects on wetlands.	Existing Condition	L	L	L	L	L	L	MM BIO-4 MM BIO-5
	No Action	L	L	L	L	L	L	Same as Existing Condition
Impact BIO-3b: Project operation would increase the amount of Federal Waters of the U.S.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact BIO-4: Project construction and operation would not interfere with	Existing Condition	L	L	L	L	L	L	MM BIO-5

Table 3.4-1 Summary of Impacts on Biological Resources

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
movement of fish and wildlife species, but construction could remove snags for colonial nesting birds.	No Action	L	L	L	L	L	L	Same as Existing Condition
Impact BIO-5a: Project construction and operation could affect nesting by some common bird species and introduction of invasive species.	Existing Condition	S	S	S	S	S	S	MM BIO-2 MM BIO-3 MM BIO-6: Clean equipment prior to site delivery.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact BIO-5b: Project construction and operation would have minor effects on common fish (native and nonnative), wildlife species, and native plant communities.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact BIO-5c: Project construction and operation would benefit common fish (native and nonnative) and wildlife species.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required

Notes:

O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

When multiple impact levels occur under one impact, only the highest level is used in the summary (e.g., in many cases S, L, and B occur).

3.4.2 Regulatory Requirements

The regulatory framework for biological resources includes the following Federal, state, and local requirements. Restoration actions at the Salton Sea could be subject to some or all of these requirements.

3.4.2.1 Federal Regulations and Executive Orders

The **Clean Water Act of 1972**, as amended (33 USC section 1251 et seq.) **(**CWA**)** provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters, as described in Chapters 5 and 6. Section 401 of the CWA requires an applicant for a Federal license or permit to obtain a certification from the state that the discharge will comply with applicable effluent limitations and water quality standards for construction and operation of the facility. Section 404 of this act prohibits discharges of dredged or fill materials into waters of the United States except as permitted under separate regulations by the Corps and the U.S. Environmental Protection Agency. This section also provides protection to "special aquatic sites" that include sanctuaries and refuges, wetlands, and mudflats.

The Federal **Endangered Species Act of 1973**, as amended, (16 USC section 1531 et seq.) protects listed threatened or endangered species (and any designated critical habitat) from unauthorized take[1]. It also directs Federal agencies to ensure that their actions do not jeopardize the continued existence of listed species. Section 7 of the act defines Federal agency responsibilities for consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) (the Services), including the preparation of the Federal agency's Biological Assessments and the Services' Biological Opinions. Section 10 of the act describes how the USFWS may authorize take of a listed species by non-Federal agencies, including preparation of Habitat Conservation Plans.

The **Migratory Bird Treaty Act of 1918**, as amended (16 USC section 703-712) provides for the protection of migratory birds by making it illegal to possess, hunt, pursue, or kill any migratory bird, or any transaction pertaining to any wild migratory bird, part, nest, egg or product, manufactured or not, unless specifically authorized by a regulation implemented by the Secretary of the Interior, such as designated seasonal hunting. Executive Order 13186 (2001) directs Federal agencies with actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a Memorandum of Understanding with USFWS within 2 years to promote conservation of migratory bird populations relative to the proposed action.

Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands) require Federal agencies to provide leadership to protect the natural and beneficial values served by floodplains and wetlands. Federal agencies are directed to avoid development in floodplains where possible, and to minimize the destruction or degradation of wetlands.

3.4.2.2 State Regulations

The **Porter-Cologne Water Quality Control Act** (Porter-Cologne) (California Water Code Title 23) protects California waters, as described in Chapter 6. Porter-Cologne gives the State Water Resources Control Board, through the Regional Water Quality Control Boards, the authority to regulate discharges of waste, including dredged or fill material, to any waters of the state similar to authority of the Corps from the Federal CWA. The Colorado River Basin Regional Water Quality Control Board (CRBRWQCB) has prepared (and amended) a basin-wide Water Quality Control Plan that serves as a guide to optimize the beneficial uses of the water within the Colorado River Basin region of California by preserving and protecting the quality of these waters.

The California Lake and Streambed Alteration Program (Fish and Game Code section 1600 et seq.) requires any person, state, or local government agency, or public utility proposing a project that could divert, obstruct, or change the natural flow of any bed, channel, or bank of a river, stream, or lake to notify the California Department of Fish and Game (DFG) before beginning the project. If DFG determines that the project could adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required.

The California Endangered Species Act of 1984 (Fish and Game Code section 2050 et seq.) provides for the protection and preservation of threatened and endangered plants and animals, and their habitat, and prohibits the taking of such species without DFG's authorization. Section 2081 lists the conditions that must be met in order for DFG to authorize take.

The California Fully Protected Birds, Mammals, Reptiles and Amphibians, and Fish statutes (Fish and Game Code sections 3511, 4700, 5050, and 5515) prohibit the take or possession of any fully

[1] As defined by the Federal Endangered Species Act, "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 USC section 1531[18]).

protected bird, mammal, reptile and amphibian, or fish. However, Fish and Game Code section 2081.7 was amended to allow DFG to authorize the take of species resulting from impacts attributable to the implementation of the Quantification Settlement Agreement (QSA) (refer to Section 1 for a discussion of the QSA). Take of fully protected species may be authorized if related to the QSA.

3.4.2.3 Local Regulations

The Imperial County General Plan (2008) contains a number of objectives and policies intended to protect biological resources, including those of the Salton Sea (see Section 3.13, Land Use for details).

3.4.3 Affected Environment

A brief regional description of biological resources is followed by a focused description of the areas that could be affected by the SCH Project. The area of potential effect for biological resources is limited to those areas of the Salton Sea ecosystem that could be affected by the Project, including the Sea's southern portion, the lower reaches of the New and Alamo rivers within approximately 5 miles of their confluence with the Sea, adjacent upland areas (primarily agricultural) that could be disturbed during construction and operation of water conveyance system(s) from the diversion location(s) to the created habitats, and agricultural drains. A buffer of approximately 0.5 mile from the Sea's shoreline and from the conveyance systems is also included for indirect effects of noise and human presence on wildlife. Figure 2-2 shows the Project area with names of places discussed in this section as well as the limits of Project activities. Data sources used to describe the affected environment include published and unpublished literature; contacts with researchers and agency personnel from the area, as well as with the Natural History Museum of Los Angeles; and field surveys for selected species of particular interest. The field surveys are described under the applicable resources below. Because the Salton Sea is continually changing, the most recent information is used where available. Often, however, information from previous years is all that is available to describe current conditions.

3.4.3.1 Vegetation

The *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources [DWR] and DFG 2007) provided general information about vegetation around the Salton Sea. Additional data sources for the Project area included Geographic Information System (GIS) files from Redlands Institute at the University of Redlands (1999), vegetation mapping completed for Imperial Irrigation District (IID 2007), 6-inch resolution aerial photographs (Southern California Association of Governments and California Department of Transportation 2008), and site visits conducted on April 29 and November 16-18, 2010. From this dataset, a map of plant communities (Figures 3.4-1 and 3.4-2) covering areas that could be affected by the Project diversions, ponds, and supporting infrastructure was created. Categories included in the plant communities' map are presented in Table 3.4-2. Vegetation in the Project area is described below, starting with plant communities of the greatest ecological importance, primarily native and naturally occurring habitats.

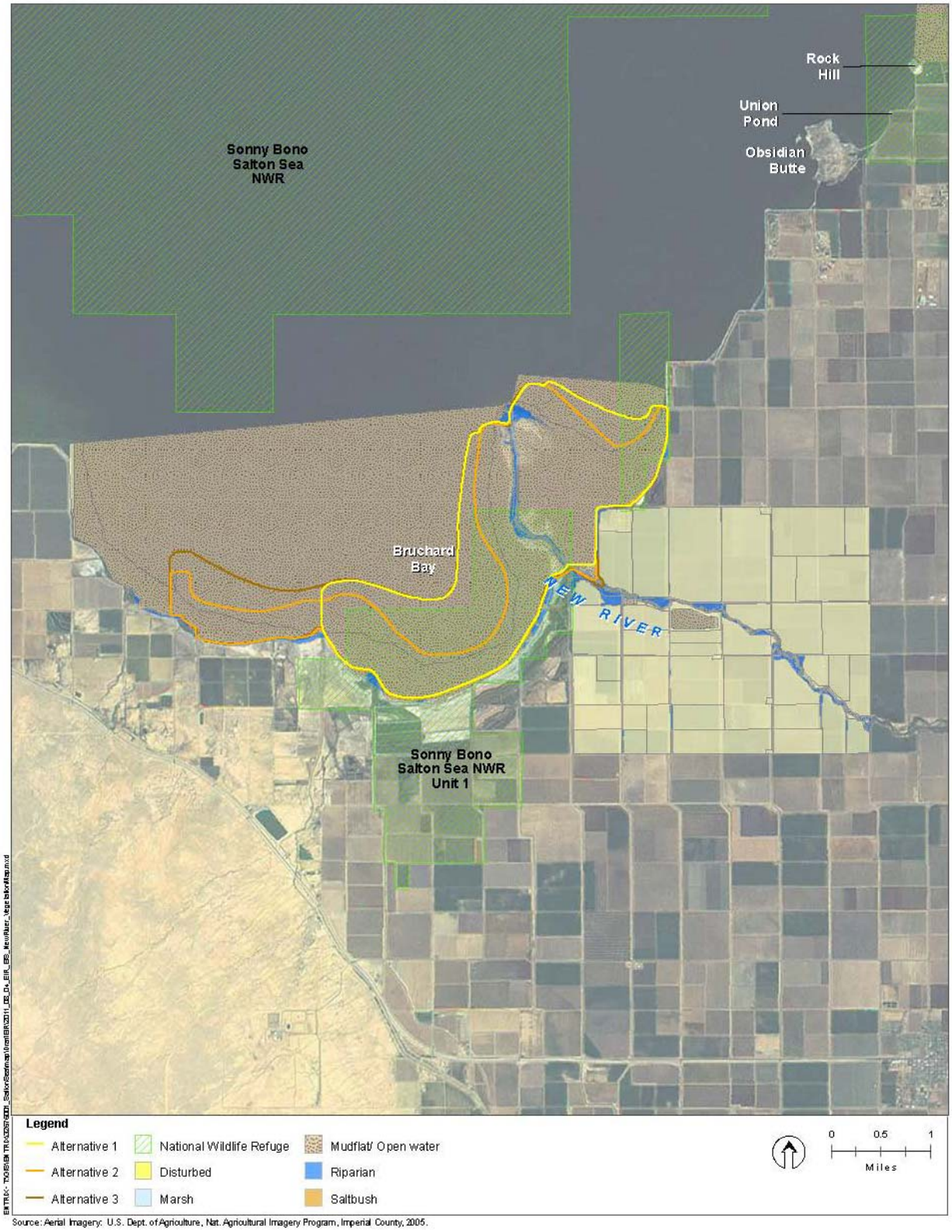

Figure 3.4-1 Plant Communities in the Vicinity of the New River

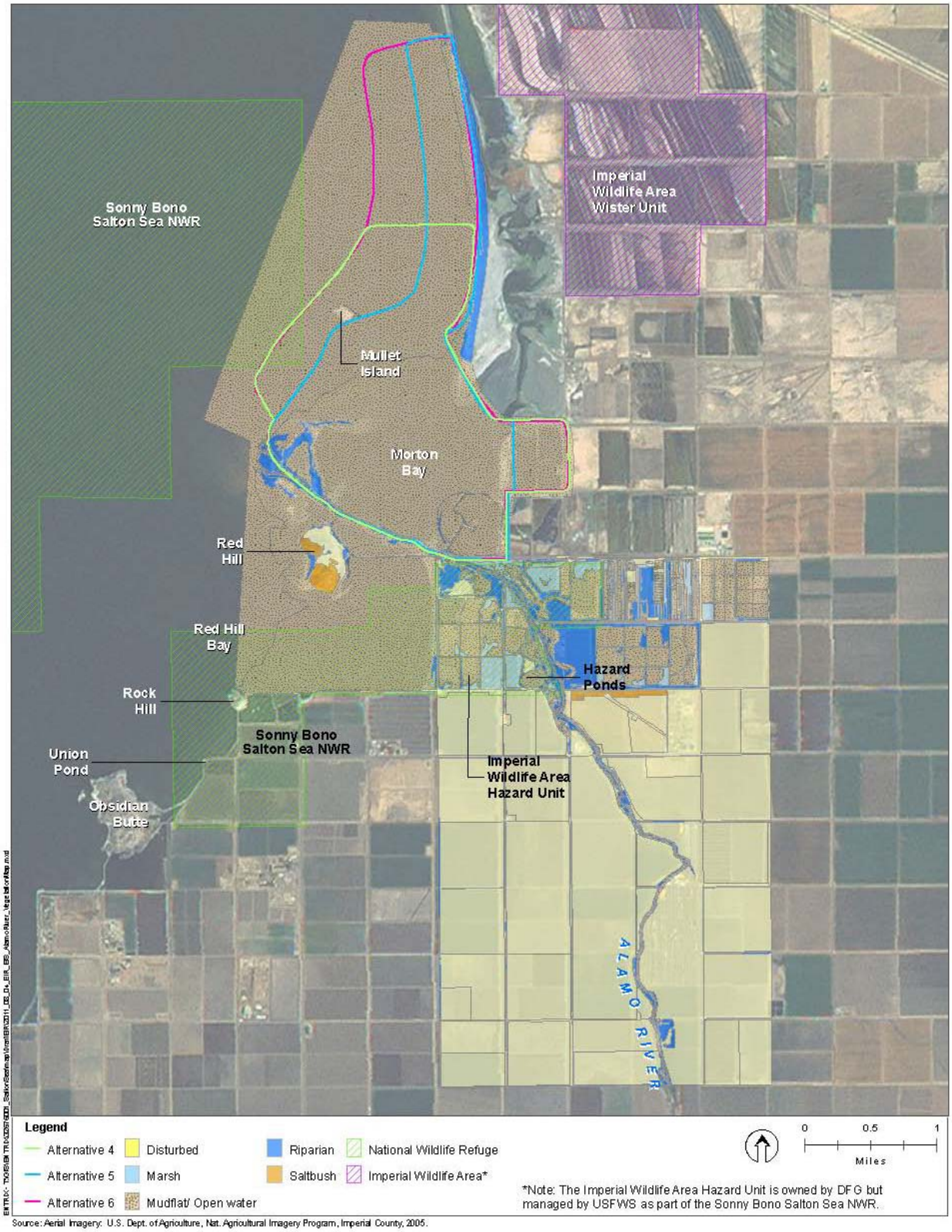

Figure 3.4-2 Plant Communities in the Vicinity of the Alamo River

3

Table 3.4-2 Mapped Vegetation/Habitat in the SCH Project Area

Vegetation/Habitat Type	Subtype	Acres in the Study Area	Characteristics	Equivalent type in Manual of California Vegetation[1]	Equivalent Type in Holland[2]
Marsh	Cattail marsh	175	Dominated by *Typha* spp. Cover is typically greater than 90 percent, but can be as low as about 20 percent. Occurs in areas with some freshwater influence.	*Typha* spp. herbaceous Alliance	Transmontane freshwater marsh
	Common reed marsh	55	Dominated by *Phragmites australis.* Cover is generally at least 80 percent, but can be as low as 20 percent. Typically occurs along waterline of major rivers.	*Phragmites australis* herbaceous alliance and seminatural stands	Transmontane alkali marsh
Riparian	Iodine bush scrub	104	Relatively open stands of iodine bush (*Allenrolfea occidentalis*) that typically occur at the margins of ponds and the Salton Sea's shore.	*Allenrolfea occidentalis* shrubland alliance	Desert sink scrub
	Arrow weed thickets	4	Patches of arrow weed (*Pluchea sericea*) occur along edges of riparian areas and marshes.	*Pluchea sericea* shrubland alliance	Arrowweed
	Tamarisk woodland	185	Dominated by *Tamarix* spp. Vegetation is generally over 6 feet and forms a continuous stand. Width or individually mapped areas of at least 20 feet. Cover is generally 90 percent or greater.	Tamarix spp. Seminatural stands	Tamarisk Scrub
	Tamarisk scrub	695	Dominated by *Tamarix* spp. Vegetation is less than 6 feet tall, or made up of widely spaced individual trees. Cover is generally less than 90 percent, or less than 20 feet wide.	Tamarix spp. Seminatural stands	Tamarisk Scrub
	Screwbean mesquite bosque	4	Open stands of screwbean mesquite (*Prosopis pubescens*) and other native species in restoration areas.	*Prosopis pubescens* woodland alliance	Mesquite bosque
	Irrigation ditches	168	Drainage ditches and irrigation canals that are at least 12 feet wide and have earthen sides; concrete-lined ditches are mapped with corresponding adjacent type, generally agriculture or disturbed.	Not applicable	Not applicable
Mudflat / Open Water	Mudflat	4,530	Unvegetated recently flooded areas.	Not applicable	Not applicable

Table 3.4-2 Mapped Vegetation/Habitat in the SCH Project Area

Vegetation/Habitat Type	Subtype	Acres in the Study Area	Characteristics	Equivalent type in Manual of California Vegetation[1]	Equivalent Type in Holland[2]
	Open Water	9,367	Areas of standing water.	Not applicable	Not applicable
Saltbush	Quail bush scrub	20	Recovering disturbed upland areas around facilities and roads dominated by quail bush (*Atriplex lentiformis*).	*Atriplex lentiformis* shrubland alliance	Desert saltbush scrub
	Desert holly scrub	35	Upland stands of desert holly (*Atriplex hymenelytra*) that occurs in one location in the study area, on Red Hill; dominated by very open stands of desert holly.	*Atriplex hymenelytra* shrubland alliance	Desert saltbush scrub
Disturbed	Disturbed/Developed	1,067	Roads and development including feedlots.	Not applicable	Not applicable
	Agriculture	8,418	Any type of irrigated agriculture. Common types in study area include spinach, grass hay, and alfalfa.	Not applicable	Not applicable

Sources: Sawyer et al. 2009; Holland 1986

Waters of the U.S. and Special Aquatic Sites

SPECIAL AQUATIC SITES

Special aquatic sites within the Project area include the Sonny Bono Salton Sea National Wildlife Refuge (Sonny Bono NWR), mudflats, and wetlands. Portions of Alternatives 1 through 3 are within the Sonny Bono NWR, and mudflats are present in all of the alternatives where Sea sediments are exposed as the water level declines. Approximately 4,530 acres of mudflat are in the study area (Table 3.4-2). Effects of the Project on the NWR and mudflats will be considered when the Jurisdictional Determination is made by the Corps.

WETLANDS

Under section 404 of the CWA, wetlands are defined as "areas that are inundated or saturated by surface or ground water at a frequency sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Three parameters are used in the field to delineate wetlands: hydrophytic vegetation (more than 50 percent of dominant plants are adapted to anaerobic soil conditions), hydric soils (soils classified as hydric or that exhibit characteristics of a reducing environment), and wetland hydrology (inundation or soil saturation during at least 5 percent of the growing season = 18 days in Southern California). For the State of California, wetlands have a similar definition, but field determination of wetlands is based on only one of the three parameters. Thus, state jurisdictional wetlands have the potential to be larger than Federal jurisdictional wetlands.

Wetlands in the Project area serve important functions such as habitat for wildlife, including for special-status species, flood storage, and improving water quality. For the purposes of this Draft EIS/EIR, the amount of wetlands present in the Project area has been preliminarily identified based on aerial photography interpretation and a limited amount of ground truthing. The extent of wetlands that would be affected by the selected Project will be quantified as part of the Jurisdictional Determination to be completed by the Corps.

Duck ponds occupy over 1,000 acres near the Salton Sea on either side of the Alamo River. Ponds are temporarily filled with fresh water when managers want to attract duck species. For this reason, the ponds are filled and drained periodically. When water remains for a sufficient period of time, vegetation typical of wetlands in this region becomes established, as described below. When ponds are drained, wetland vegetation dies back. Vegetation present in duck ponds was mapped based on aerial photography interpretation and observations during site visits for the Project.

Approximately 230 acres of wetlands (marsh designation in Table 3.4-2) in the study area have been mapped as cattail (*Typha* spp.) marsh and common reed (*Phragmites australis*) marsh. Cattail marshes occasionally include other common freshwater species such as California bulrush (*Scirpus* [*Schoenoplectus*] *californicus*). A limited amount of this type is present in the Project area, and generally is found in mostly freshwater ponds, particularly near the outlet of the Alamo River. In this area, some ponds have dense, impenetrable cattail stands. Other more open ponds have narrow bands of iodine bush (*Allenrolfea occidentalis*) scrub around their perimeter.

Common reed is a nonnative perennial that grows in shallow water and at the edge of water along both the Alamo and New rivers, especially within 0.5 mile of the Salton Sea. Some ponds near the outlet of the Alamo River support dense stands of common reed at their edges or throughout.

WATERS OF THE U.S.

Waters of the U.S. refers to areas under the Corps' jurisdiction pursuant to section 404 of the CWA and is generally defined by the ordinary high water mark. The Corps' jurisdiction can extend beyond the

ordinary high water mark, to the limit of the wetland, when adjacent wetlands are present. Wetlands can also occur within Waters of the U.S. The Salton Sea is a traditional navigable water, and its tributaries, the New and Alamo rivers, are Waters of the U.S. The ordinary high water mark at the Salton Sea was mapped as the -231-foot elevation contour for the impact analysis, based on the average elevation from June 21, 2009 through June 20, 2010. The Salton Sea below this elevation was determined to be waters of the U.S.

Riparian Vegetation

Riparian vegetation in the study area consists almost exclusively of tamarisk (*Tamarix* spp.) trees and shrubs and small stands of arrow weed (*Pluchea sericea*). Relatively closed-canopy stands of mature tamarisk were mapped as tamarisk woodland, generally consisting of tamarisk over 6 feet tall with a continuous canopy. More open stands and stands that consist of lower-stature vegetation were mapped as tamarisk scrub. Although tamarisk is a nonnative species, the structure of this habitat and its proximity to water are important to many wildlife species, as discussed in Section 3.4.3.3, Wildlife.

One small stand of screwbean mesquite (*Prosopis pubescens*) occurs at a restoration site along the Alamo River, and another one occurs along the New River. These areas are small and support relatively small stands of establishing trees. When the trees are mature, they may have a continuous canopy. This plant native community is considered rare and threatened throughout its range (Sawyer et al. 2009).

Upland Native Vegetation

Several small stands of native upland vegetation consisting of quail bush (*Atriplex lentiformis*) scrub and desert holly (*Atriplex hymenelytra*) scrub occur in widely scattered locations in the Project area.

Nonvegetated Areas

Approximately 4 percent of the study area is primarily disturbed and developed areas such as roads, buildings, and a geothermal facility near the Alamo River. In addition, a large (approximately 427-acre) feedlot adjacent to the Alamo River was mapped as disturbed/developed. Other nonvegetated areas include mudflats and open water.

Agriculture

The majority (34 percent) of the study area is irrigated agriculture, and the primary agricultural crops present at the time of the November 2010 site visit included spinach, various types of grass hay, and alfalfa. No orchards, vineyards, or other woody crops were present in the study area, although several orchards were noted west of the New River, south of the study area.

Irrigation Ditches

Irrigation ditches include both drains taking water away from the fields and water supply canals bringing water to the fields. For the purposes of this analysis, irrigation ditches that have earthen sides and are more than about 12 feet wide were included in the mapped category “drainage ditches.” Vegetation specific to each ditch was not recorded because it changes over time based on use of an individual ditch, level of salinity, and frequency and timing of vegetation clearing by the landowner. Hence, vegetation determinations made at one point in time are of limited use for this analysis. Concrete-lined irrigation ditches were mapped with the adjacent agriculture or disturbed/developed category because the biological value of lined ditches is very limited.

3.4.3.2 Aquatic Habitats and Biota

Three discrete biological phases, based primarily on water chemistry and species abundance, have occurred at the Salton Sea since it formed in 1905. The initial “Freshwater Phase” began when the basin

first started filling and continued until the Sea's salinity became similar to ocean water in the early 1940s. The "Marine Phase" was the period during which the Salton Sea salinity remained near that of ocean water (about 34,000 milligrams per liter = 34 parts per thousand [ppt]) and occurred from the 1940s into the 1980s. The "Hypersaline Phase" began in the 1980s when salinity levels exceeded 40 ppt and continues into the present (DWR and DFG 2007). The Sea's salinity level is currently 51 ppt, which is approximately 50 percent higher than ocean water (DWR 2010).

Inflow to the Sea comes from sources such as the Whitewater, Alamo, and New rivers; agricultural drains; and several small streams. These inflows contain salts from natural soil leaching, treated wastewater, and Colorado River water used for crop irrigation. Evaporation is high in this area (approximately 69 inches/year) (DWR and DFG 2007), resulting in loss of water from the Sea's surface while leaving the salts. The inflows vary on scales ranging from daily to multiyear while no outflows occur to remove water or salts.

Salton Sea Aquatic Habitats

The Salton Sea supports aquatic habitats that function at multiple scales to contribute to the overall biological diversity and use of the area by fish and wildlife. The Sea's aquatic habitats include its shoreline and associated shallow water areas, open (deep) water, and areas where the New, Alamo, and Whitewater rivers enter the Sea.

Shoreline/Shallow Water. The shallow shoreline area extends around the Sea's perimeter and around islands within the Sea. At a surface elevation of -228 feet mean sea level (msl), the Salton Sea has approximately 120 miles of shoreline. The area occupied by this shallow water habitat is influenced by topography, with a relatively narrow band of habitat occurring on the steeper slopes (e.g., eastern and western shores) with considerably greater amounts of this habitat along the more gently sloping northern and southern shores. Along the Sea's southeastern edge, particularly near Imperial Wildlife Area's (IWA's) Wister Unit, relatively flat areas periodically form large mudflats (DWR and DFG 2007).

The substrate along the Salton Sea's shoreline, especially at depths of less than 1 foot, is composed of intact and broken barnacle shells and unconsolidated sediments ranging from coarse sand to gravel (Detwiler et al. 2002). Hand auger and vibracore samples within the proposed Project area found sediments within the top 1 foot to be primarily clays (e.g., fat clay or lean clay) with some areas of silt or mixed silt/sand; shell fragments were present at some locations along the shoreline (Appendix C). Pools along the shoreline formed by sand or barnacle shell bars parallel to shore and connected to the Salton Sea and/or drains vary in size over time due to changes in the Sea's water surface elevation (DWR and DFG 2007). The size of these pools ranged from about 100 acres to less than 1 acre (Sutton 1999).

In some areas along the Salton Sea, trees killed by inundation from past increases in the water elevation remain in shallow water along the shoreline. Most of the snags are located in the Whitewater River delta, near IWA's Wister Unit, and at Morton Bay (DWR and DFG 2007). The submerged portions of snags provide structure and habitat diversity in the water column. These structures are not permanent, and they continue to degrade and collapse over time. Other structures situated in inundated areas also provide a similar function.

Open Water. The vast majority of the Salton Sea (currently over 200,000 acres) is open water with depths of up to 46 feet. The Sea's open water areas are subject to periodic events that can make large portions of the Sea lethal or uninhabitable to most aquatic life. During parts of the year, the Salton Sea becomes stratified with cooler water forming a distinct layer below the warmer surface water. This lower layer becomes anoxic (deprived of oxygen) because of its isolation from the surface and the photosynthetic activity that occurs in that portion of the water column where light can penetrate. The combination of high levels of organic material and biological activity in the sediments under anoxic

conditions produce toxic compounds, such as hydrogen sulfide. These compounds are periodically released to the surface waters when thermal stratification breaks down during high winds and seasonal changes in air temperature. During these turnover events, aquatic life (especially fish) can be killed over vast areas of the Sea. The effect of these events is less pronounced in the nearshore areas that remain oxygenated year-round (DWR and DFG 2007).

River Mouths and Deltas. The primary inflows into the Salton Sea include the New and Alamo rivers in the south and the Whitewater River in the north. Smaller inflows come from San Felipe Creek in the west and Salt Creek in the east as well as numerous agricultural drains that discharge directly into the Sea. These inflows result in estuarine areas where the inflow mixes with the Sea's saline waters. The size of these estuarine areas is influenced primarily by the amount of inflow. The New and Alamo rivers, which constitute nearly 80 percent of the inflow to the Salton Sea, contribute to the largest of these areas. Factors such as depth, inflow quality, and wind conditions also influence the habitat at the river mouths/deltas. Sediment deposition in these areas forms deltas that contribute to the complexity and diversity of the habitat. Similar conditions occur at the mouth of the Whitewater River and, to a lesser extent, the mouths of creeks and agricultural drains that discharge directly to the Salton Sea. These areas are relatively small, yet very productive (DWR and DFG 2007).

The size of the areas influenced by inflow varies on a daily to seasonal basis in relation to the volume of water discharged to the Salton Sea at each location. Brackish waters ranging from 10 to 30 ppt extend about 1,600 to 3,300 feet offshore from the New and Alamo river mouths (Costa-Pierce 2001), with the larger areas occurring during summer when irrigation runoff is high. The size of the area influenced by the brackish water inflow from the New and Alamo rivers is estimated to be about 100 to 250 acres (Costa-Pierce and Riedel 2000).

Other Aquatic Habitats

Other aquatic habitats associated with or adjacent to the Salton Sea include the Whitewater, New, and Alamo rivers; San Felipe and Salt creeks; numerous agricultural drains, some of which discharge directly to the Salton Sea; and managed freshwater marshes. Only the New and Alamo rivers and a number of drains are within the SCH Project study area.

Rivers and Drains. Both the New and Alamo rivers were modified by the same event that created the current Salton Sea (CRBRWQCB 2006). The Alamo River is the Sea's largest tributary, contributing approximately 50 percent of the Sea's annual inflows. The Alamo River's source of water is almost entirely from discharge of agricultural irrigation water (imported from the Colorado River) from over 900 miles of agricultural drains in the Imperial Valley (CRBRWQCB 2002a). The New River originates in Mexico and flows through Mexicali before entering the U.S. Flow in the river is primarily (87 percent) from agricultural drain discharges; other water sources are treated municipal and industrial wastewater from Imperial Valley (2 percent), partially treated and untreated municipal and industrial wastewater from Mexico (8 percent), and stormwater runoff (3 percent) (CRBRWQCB 2002b). Both rivers carry a high sediment load. Generally small areas of fresh to brackish marsh are present in some of the drains and in low areas adjacent to the rivers.

Freshwater Marsh. In the Salton Sea Basin, areas constructed and managed for waterfowl are the primary areas that represent freshwater marsh. Depending on the goals of the managing entity, these marshes are flooded perennially or seasonally, and support no vegetation to vegetative communities dominated by cattails, tules, or other aquatic vegetation interspersed with areas of open water and islets. Managed marsh areas adjacent to the Salton Sea include portions of the existing Sonny Bono NWR, IWA, and duck clubs. Operations of the existing managed marshes are constrained by the availability of fresh water (DWR and DFG 2007).

Presently, Sonny Bono NWR contains approximately 826 acres of freshwater marsh (USFWS 2010a). Additional freshwater marsh is present in the IWA. In addition to the freshwater marsh within these two areas, about 10,309 acres of duck ponds were present in IID's service area in 2009 (IID 2010). The duck ponds are generally located in northern Imperial Valley between Niland and the Salton Sea. The ponds typically are small and heavily vegetated with aquatic vegetation. These freshwater marsh areas are flooded seasonally to coincide with the waterfowl hunting season and to promote characteristics attractive to waterfowl.

Salton Sea Aquatic Biota

Aquatic biota in the Salton Sea include invertebrates and fish. The initial aquatic biota (both invertebrates and fish) present in the Salton Sea were those that came in with the water from the Colorado River. Species from the rivers, creeks, and drains also entered the Sea. Subsequently, a variety of invertebrate and fish species have been stocked in the Sea as salinity increased. Invertebrates also entered the Sea in the water with the stocked fish. Aquatic organisms that currently or in the recent past comprise the food web supporting fish in the Sea include phytoplankton, zooplankton, and benthic and water column macroinvertebrates. Macroinvertebrate species include diptera (flies), corixids (water boatmen), benthic polychaetes such as pileworms (*Neanthes succinea*) and a spionid worm (*Streblospio benedicti*), amphipods (*Gammarus mucronatus* and *Corophium louisianum*), ostracods (seed shrimp), and a barnacle (*Balanus amphitrite*) (Detwiler et al. 2002; Miles et al. 2009) while zooplankton is dominated by copepods (Miles et al. 2009).

Between 1929 and 1956 nonnative fish were introduced into the Sea on more than 20 occasions consisting of more than 30 species, some of which were introduced repeatedly (Walker 1961). Between 1948 and 1956, DFG introduced fish with the intention of creating a marine sport fishery (Walker 1961). Although a number of fish species were present in the Salton Sea while salinity was in the range of marine waters, those fish were introduced for recreational fishing and not as forage for birds. Tilapia that inhabit the Sea are hybrids between the Mozambique tilapia (*Oreochromis mossambicus*) and Wami River tilapia (*O. urolepis hornorum*) (Costa-Pierce 2001). These fish, called California Mozambique hybrids ("Mozambique hybrid tilapia"), are currently the most abundant fish in the Sea and have been extensively used as forage by birds due to their range in size classes and location within the water column that make them available for bird foraging.

The shoreline pools and shallow waters provide habitat for desert pupfish (*Cyprinodon macularius)* (discussed in more detail below under Special-Status Species) (Sutton 1999) and sailfin molly (*Poecilia latipinnna*), as well as other fish and invertebrates. These areas also provide important spawning and nursery habitat for tilapia. The smaller fish in shallow waters feed on invertebrates as well as algal material. Rocky shoreline habitats also provide valuable refugia for invertebrates during periods when hypoxic or anoxic conditions persist in the Salton Sea (Detwiler et al. 2002).

The open water supports fish and invertebrate production. Until recently, these areas also provided habitat for pelagic spawning fish such as orangemouth corvina (*Cynoscion xanthulus*). Orangemouth corvina, along with Gulf croaker (*Bairdiella icistia*) and sargo (*Anisotremus davidsoni*), have not been detected in the Sea since 2003 (DFG 2008) and are probably no longer present due to the Sea's increased salinity. The distribution of fish in the open water is concentrated along the nearshore areas. The Salton Sea's tilapia (Mozambique hybrid tilapia) population has risen considerably since 2003, contributing to elevated fish numbers in the Sea (DFG 2008).

The river mouths, particularly in the Sea's southern part, provide an area of reduced salinity and higher dissolved oxygen (DO). Mozambique hybrid tilapia is the only fish species that has been recently collected near the river mouths, although common carp (*Cyprinus carpio*), threadfin shad (*Dorosoma petenense*), striped mullet (*Mugil cephalus*), striped bass (*Morone saxatilis*), and mosquitofish (*Gambusia*

affinis) occasionally enter the Sea from the rivers (personal communication, S. Keeney 2011). In the past, orangemouth corvina had been reported to congregate (possibly for spawning) where freshwater flows into the Salton Sea, possibly due to higher DO or better water quality (Costa-Pierce 2001). No amphibians occur within the Salton Sea itself due to the high salinity.

Other Habitat Aquatic Biota

Invertebrates in the Alamo River and agricultural drains include plankton, snails, midge larvae (chironomids), Asiatic clams (*Corbicula fluminea*), and crayfish (CRBRWQCB 2002a). Fish species present in the New River include blue tilapia (*Oreochromis aureus*), common carp, and channel catfish (*Ictalurus punctatus*) (personal communication, J. Crayon 2010; U.S. Department of Health and Human Services 2000). Other species reported in the Alamo and/or New rivers include orangemouth corvina, Mozambique tilapia, threadfin shad, channel catfish, flathead catfish (*Pylodictis olivaris*), red shiner (*Cyprinella lutrensis*), largemouth bass (*Micropterus salmoides*), and mosquitofish (CRBRWQCB 2002a; Costa-Pierce and Riedel 2000).

Fish in the agricultural drains include sailfin molly, red shiner, mosquitofish, longjaw mudsucker (*Gillichthys mirabilis*), common carp, desert pupfish, shortfin molly (*Poecilia mexicana*), porthole livebearer (*Poeciliopsis gracilis*), Mozambique tilapia hybrids, redbelly tilapia (*Tilapia zillii*), and possibly blue tilapia (*Oreochromis aureus*) (Crayon and Keeney 2005; personal communication, J. Crayon 2010, S. Keeney 2011; CRBRWQCB 2005). Spiny softshell turtles (*Apalone spinifera*), bullfrogs (*Lithobates catesbeianus*), and Rio Grande leopard frogs (*Lithobates berlandieri*) are also present in the rivers and agricultural drains; the checkered garter snake (*Thamnophis marcianus*) occurs in agricultural drains/canals and marshes (personal communication, J. Crayon 2011).

Aquatic Biota Habitat Requirements

The SCH ponds are being designed to support fish that provide prey for piscivorous birds (Appendix D). A number of fish species have been evaluated for introduction to the ponds; however, only species that are currently or have been present in the recent past and that generally are not predators on desert pupfish are being considered (DFG 2011b). Table 3.4-3 summarizes the habitat requirements of the fish species most likely to be introduced into the ponds. Salinity, temperature, and DO levels that will support fish will also support invertebrates and other components of the aquatic food web.

Table 3.4-3 Fish Habitat Requirements

Species	Salinity (ppt)	Temperature (°C)	DO	Breeding	Food
Mozambique tilapia (hybrid)	0-65	15-37	Relatively low	Maternal mouthbrooder	Plankton, aquatic invertebrates, decomposing organic matter
Redbelly tilapia	0-29 (45 in Sea)	20-40	Relatively low	Lay eggs in nest and guard	Plants, some invertebrates
Sailfin molly	0-87	Tolerate local temperatures	Relatively low	Internal livebearers	Algae and other plant material, some aquatic invertebrates
Threadfin shad	15-32	1-35 (die-offs below 5.5)	Sensitive to sudden changes in DO	Spring and fall in open water over or near objects	Zooplankton, pelagic fish eggs and larvae, phytoplankton
Desert pupfish	0-68	7-42.5	Extremely low (to 0.1-0.4)	Lay eggs over substrate	Algae, small invertebrates, detritus

3.4.3.3 Wildlife

The principal references reviewed to obtain information regarding wildlife, including special-status wildlife, within the Project area and a buffer of 0.5 mile are:

- The DFG California Natural Diversity Database (CNDDB) *Special Animals List*, reviewed in 2010;
- *Birds of the Salton Sea* (Patten et al. 2003) for descriptions of status and habitats on or adjacent to Project site;
- Birds of North America Online for range and habitat descriptions from various authors;
- Natural History Museum of Los Angeles County;
- Sonny Bono NWR (USFWS 2010b, c) occurrence data; and
- Studies on patterns of abundance, distribution, annual phenology, and habitat associations (Shuford et al. 2000).

In addition, observations of wildlife during focused surveys for Federally listed bird species (Dudek 2010) were recorded.

Common Bird Species

The Salton Sea ecosystem has become one of the most important habitats for birds in North America and supports some of the highest levels of avian biodiversity in the southwestern United States. Recent studies have documented the great importance of the Salton Sea ecosystem in providing habitat for migrating and resident waterbirds, particularly those migrating within the Pacific Flyway. More than 400 resident, migratory, and special-status bird species have been recorded in the Salton Sea Basin; about 270 of those species, including 33 bird species that are threatened, endangered, or of special concern (see Section 3.4.3.4), use the Basin on a regular basis. In addition to the diversity of birds, studies have indicated that the large number of individual birds using the Salton Sea is even more ecologically relevant than the number of species due to its importance as a migratory stopover and wintering area for hundreds of thousands of birds (DWR and DFG 2007).

The Basin provides important habitat for 48 species of gulls (40,000+ individuals), terns, and shorebirds. It is one of only five areas in the interior of western North America used by tens of thousands of birds in spring (Shuford et al. 2000). Some common aquatic bird species for which the Salton Sea provides important habitat include American avocet (*Recurvirostra americana*), American coot (*Fulica americana*), American wigeon (*Anas americana*), American white pelican (*Pelecanus erythrorhynchos*) (30 percent of North American breeding population), black-necked stilt (*Himantopus mexicanus*), California brown pelican (*Pelecanus occidentalis*), eared grebe (*Podiceps nigricollis*) (90 percent of North American population in some years), and ruddy duck (*Oxyura jamaicensis*) (50 percent of Pacific Flyway population) (USFWS 2010b; Shuford et al. 2000; Jehl 1994). Bird populations vary throughout the year as birds migrate to the Sea for breeding and as they stop over during migration to points north and south. The American avocet, American coot, American white pelican, California brown pelican, and ruddy duck are all found at the Salton Sea throughout the year. The American wigeon and eared grebe are absent for a few months in the summer (USFWS 2010b).

Point count surveys conducted within and near the Project area in 2009 (USFWS 2010b) show that the American avocet population is more abundant during August and September with numbers of individuals reaching into the thousands, while the American coot's population is greatest in March with numbers of individuals also reaching the thousands. The American wigeon is present in greater numbers in January and February with counts of over 5,000 individuals and is absent from the Salton Sea during the summer months (June through September). American white pelican populations peak twice during the year, first

from January through March and then again from July through September with populations in the low thousands and then remaining in the hundreds during other months. California brown pelicans follow a similar pattern with a population increase in January and then again from June through September. The eared grebe population is greatest in January with a peak of over 5,000 individuals, which then declines in the summer and fall months. The ruddy duck population is highest in the winter to early spring (November through April) with the greatest numbers occurring in February (over 13,000 individuals), which then also declines in the summer months.

Numerous other bird species occur within the Project region as residents, visitors, and migrants. A total of 107 species of waterbirds were recorded for the Salton Sea in 1999 (Shuford et al. 2002) and include western and Clark's grebes (*Aechmophorus occidentalis* and *A. clarkii*, respectively); wading birds such as herons, egrets, and night-herons; and a number of waterfowl species such as snow (*Chen caerulescens*) or Ross's (*Chen rossii*) geese, northern shoveler (*Anas clypeata*), northern pintail (*Anas acuta*), and green-winged teal (*Anas crecca*). A number of raptor species have been recorded at the Salton Sea, most of which are discussed below. Shorebird species and numbers tend to peak during migration with large numbers of black-bellied plover (*Pluvialis squatarola*), black-necked stilt (also occurs in large numbers as a breeding species), willet (*Tringa semipalmata*), marbled godwit (*Limosa dedoa*), western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*), dowitchers (*Limnodromus* spp.), and Wilson's phalarope (*Phalaropus tricolor*).

The Caspian tern (*Hydroprogne caspia*) is a common breeding bird that occurs within the Salton Sea region from mid-April through October. It is most abundant at the Sea from late summer through fall. Most Caspian terns depart from the region by the end of October, but some remain through the winter (Patten et al. 2003). Caspian terns forage primarily or exclusively for fish but may occasionally take crayfish and insects (Cuthbert and Wires 1999). Approximately 25 percent of the North American population of the Caspian tern breeds at the Salton Sea (Cuthbert and Wires 1999; personal communication, K. Molina 2010). In 2009, the population size within the Project area was in the hundreds for the winter months and in the thousands for the breeding season (USFWS 2010b). In 2010, nesting numbers of Caspian terns were up to several thousand breeding pairs, predominantly on Mullet Island and the D pond islands but also along Morton Bay's shore (personal communication, K. Molina 2010).

In 2009, the California gull (*Larus californicus*) was found at the Salton Sea, primarily in December (USFWS 2010b). A few occurrence records are present for January, May, and June, although the numbers are much lower than the counts from December. This species was observed during summer 2010 surveys (Dudek 2010), and Molina (2004) states that the California gull colonized the Sea in 1996 and has nested annually since then in small numbers. It also winters at the Sea (Winkler 1996) and can be found throughout the year (USFWS 2008).

The double-crested cormorant (*Phalacrocorax auritus*) is a year-round resident of the Salton Sea with the highest counts occurring in November, December, and February; however, populations remain steadily in the thousands throughout the year. They nest regularly at the Sea. The largest nesting colony was on Mullet Island off the southeastern shore (Massey and Zembel 2002), but they also nest along the Alamo River (personal communication, K. Molina 2010) as discussed below for rookeries.

The laughing gull (*Leucophaeus atricilla*) was only observed at the Salton Sea in August during 2009 bird counts (USFWS 2010b), but was observed during summer 2010 surveys (Dudek 2010), and it is a fairly common summer and fall visitor. The Sea is the only area where the laughing gull occurs regularly in the western U.S. It has been observed nesting at Sonny Bono NWR after several decades of no breeding activity (Patten et al. 2003).

The long-billed curlew (*Numenius americanus*) is present throughout the year at the Salton Sea, but thousands occur in the Imperial Valley in the winter (20 percent of world population) (Audubon California no date). Those staying year-round are likely first-year birds, and they concentrate around Red Hill, Obsidian Butte, and Bruchard Bay (Patten et al. 2003). In 2009 (USFWS 2010b), the long-billed curlew population was greatest in July and November. This species was observed during summer 2010 surveys (Dudek 2010). Curlews may occur along the mudflats and shoreline but occur in highest numbers in agricultural lands.

Least terns (*Sternula antillarum*) at the Salton Sea may be either from coastal California or more likely from Mexico. It has not been recorded breeding at the Sea, but may breed due to recent observations of pairs. This species was not observed in the 2009 aquatic surveys (USFWS 2010b) or by Dudek in 2010. The least tern probably occurs at the Sea on an annual basis and has been observed at Sonny Bono NWR's Unit 1, Red Hill, IWA's Wister Unit, and at other locations farther away from the Project area. It occurs most often on mudflats and at the deltas of the New and Alamo rivers where it forages in fresh water in rivers or ponds (Patten et al. 2003).

The Salton Sea is an important migratory stopover for thousands of black terns (*Chlidonias niger*), but the species does not breed at the Sea (Patten et al. 2003; Shuford et al. 2000). In 2009, it was most abundant in May and then occurred in smaller numbers from June through December (no records for November) (USFWS 2010b). It was also observed during summer 2010 surveys (Dudek 2010) and could utilize open water and marshes around the Project area.

The northern harrier (*Circus cyaneus*) is a common winter visitor and is a nonbreeding summer visitor (Patten et al. 2003); it was also observed on several occasions during the summer 2010 surveys (Dudek 2010). Suitable foraging habitat within the Project area includes agricultural fields, marshes, and open scrub habitats.

The white-faced ibis (*Plegadus chihi*) occurs in large numbers at the Salton Sea as a winter visitor (up to 50 percent of California population) (National Audubon Society 2011) and migrant (30 percent of world population) (Audubon California no date). It also is a nonbreeding summer visitor with numbers often exceeding 15,000 year-round (Patten et al. 2003; Shuford et al. 2000). It has attempted to nest periodically, and a relatively small colony is located at Finney Lake outside of the Project area. In 2010, the species was observed flying overhead in flocks of several hundreds of individuals (Dudek 2010). It nests in marsh habitat and forages in muddy ground and marshes; in shallow ponds, lakes, and rivers; and in flooded fields and estuaries. CNDDB has records from 1980 near the New River mouth.

The American white pelican (*Pelecanus erythrorhynchos)* formerly bred at the Salton Sea up to the 1950s but occurs now primarily as a migrant and winter resident. The Sea is an important wintering site for approximately 30 percent of the North American breeding population of American white pelicans and at times supports a substantial proportion of the species' world population (Patten et al. 2003; Shuford et al. 2000). As recently as 1999, nearly 23,000 individuals were observed in aerial surveys at the Sea (Shuford et al. 2000). Wintering birds congregate at the river mouths, loaf on sandbars and mudflats, and forage in shallow water. In 2009, the American white pelicans were most abundant in August with almost 3,000 individuals recorded near and within the Project area; numbers declined in the fall but the species remained a consistent visitor throughout the year (USFWS 2010b). This species was observed during Summer 2010 surveys near the mouths of the New and Alamo rivers and along the shoreline foraging within the Sea in rafts of several hundred (Dudek 2010); suitable loafing habitat includes sandbars and mudflats within the Project area.

Riparian Bird Species

A total of 115 species of birds were recorded within or adjacent to the riparian habitat along the New and Alamo rivers during the focused riparian surveys in 2010 (Dudek 2010). Bird species associated with riparian habitat that were commonly observed included song sparrow (*Melospiza melodia*), Abert's towhee (*Melozone aberti*), verdin (*Auriparus flaviceps*), house finch (*Carpodacus mexicanus*), black phoebe (*Sayornis nigricans*), common yellowthroat (*Geothlypis trichas*), red-winged blackbird (*Agelaius phoeniceus*), and marsh wren (*Cistothorus palustris*) (Dudek 2010).

Rookeries

A number of bird species occur at the Salton Sea as colonial nesting species specifically using rookeries including double-crested cormorant, great blue heron (*Ardea herodius*), and great (*Ardea alba*), snowy (*Egretta thula*), and cattle (*Bubulcus ibis*) egrets. During the 2010 focused surveys, rookeries of the double-crested cormorant and great blue heron were observed at the mouth of the Alamo and New rivers. The double-crested cormorant also breeds on Mullet Island in one of the largest North American colonies (Shuford et al. 2002). Great blue herons also are recorded within rookeries along the shoreline around IWA's Wister Unit and the New River delta (Shuford et al. 2000; Patten et al. 2003). The great blue heron does not form dense nesting colonies, but the species uses snags of partly submerged dead trees at the Salton Sea. Great egret nesting tends to be more colonial with sites concentrated along the shoreline at IWA's Wister Unit and Morton Bay around the delta of the New River (Patten et al. 2003). Similar to the great blue heron, the great egret nests in partially submerged snags. The snowy egret is similar to the great egret in nesting behavior and locations (Patten et al. 2003). At the Salton Sea, the cattle egret establishes massive rookeries (Patten et al. 2003), and during the 2010 surveys, hundreds to thousands of individuals were observed flying up and down the New and Alamo rivers (Dudek 2010). The rookeries for the cattle egret were only located along the Alamo River (Shuford et al. 2002; Dudek 2010).

Other Terrestrial Wildlife Species

A number of common terrestrial wildlife species occur in the Project area. Common terrestrial reptiles include side-blotched lizard (*Uta stansburiana*), desert spiny lizard (*Sceloporus magister*), western diamond-backed rattlesnake (*Crotalus atrox*), and gopher snake (*Pituophis catenifer*). They are found in upland habitats within the Project area, especially in habitat associated with agricultural development that provides subsidies of water and forage species. Common mammals of riparian, upland, and agricultural habitats of the Project area include coyote (*Canis latrans*), raccoon, (*Procyon lotor*), muskrat (*Ondatra zibethicus*), Virginia opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), desert cottontail (*Sylvilagus audobonii*), round-tailed ground squirrel (*Spermophilus tereticaudus*), and western pocket gopher (*Thomomys bottae*).

3.4.3.4 Special-Status Species

Special-status species are defined here as plants and animals that are:

- State and/or Federally listed as threatened or endangered;
- Proposed or candidates for state or Federal listing;
- California Native Plant Society (CNPS) List 1B and List 2;
- State Species of Special Concern (SSC); and
- California fully protected.

Focused surveys for the least Bell's vireo and southwestern willow flycatcher, both state and Federally listed as endangered, were conducted for the Project from May through July 2010 (Dudek 2010). Other listed and special-status species were also recorded when observed during these surveys.

For the least Bell's vireo, the currently accepted USFWS protocol (2001) was followed and included eight site visits spaced approximately 10 days apart.

For the southwestern willow flycatcher, the USFWS-approved protocol (Sogge et al. 2010) was followed. This protocol involved 5 surveys between May 15 and July 17 that were separated by at least 5 days using recorded southwestern willow flycatcher vocalizations to induce southwestern willow flycatcher responses. Various subspecies of willow flycatcher are not easily differentiated visually or by call or song in the field, and any resident willow flycatchers observed in the final survey period were assumed to be the "southwestern" subspecies. Nonresident willow flycatchers (those not observed during the third survey period) were assumed to be migrant willow flycatchers. Surveys for the southwestern flycatcher were conducted under section 10(a), Permit Numbers TE-781084, TE-813545, TE-840619, and TE-051248.

Table 3.4-4 lists the special-status species known or that have the potential to be present in the Project area. Species with no known records in the area, for which focused surveys were negative, for which the species would not be present during the "season of concern" as addressed for bird Species of Special Concern (Shuford and Gardali 2008), for which CNDDB does not track the life stage during which they are present at the Salton Sea, or for which suitable habitat is not present within or near areas that could be affected by the SCH Project, are not included in this table. Species evaluated but not meeting the criteria to be in Table 3.4-4 are listed in Appendix H along with the reasons why they were not included for analysis in this document.

Table 3.4-4 Special-Status Species Potentially Affected by the SCH Project

Common Name	Scientific Name	Status (Fed / State / CNPS)	Potential to be Present/Notes
Fish			
Desert pupfish	*Cyprinodon macularius*	E / E / –	High. Inhabits the Salton Sea and associated shoreline pools (some may not be connected to the Sea), tributaries to the Sea, and many of the drains that empty directly into the Sea.
Birds			
Redhead	*Aythya americana*	– / SSC / – (breeding)*	High. Uses lacustrine waters, foothills and coastal lowlands, and along the coast and Colorado River. Nests in freshwater emergent wetlands bordering open water. Fairly common breeding resident at the Salton Sea, breeding in freshwater habitats with dense cover at the margins such as found around Sonny Bono NWR. They may also nest in drains with slow-moving water if emergent vegetation is present for cover (Patten et al. 2003). Observed during summer 2010 surveys at the mouth of the Alamo River and observed flying along the river channel (Dudek 2010).
White-tailed kite	*Elanus leucurus*	– / FP / –	High. Use open grasslands, savannah-like habitats, agricultural fields, wetlands, oak woodlands, and riparian habitats. Suitable habitat within the Project area includes tamarisk woodland for nesting and agricultural lands and other sparsely vegetated areas to forage for small rodents. Although the kite is typically a migrant and winter visitor to the Salton Sea region, it has nested on occasion in Imperial Valley and appears to be expanding its range. It was recorded nesting at the mouth of the New River in 1993 and may have nested along the New River in 2000 (outside the Project area) east of Fig Lagoon and near

Table 3.4-4 Special-Status Species Potentially Affected by the SCH Project

Common Name	Scientific Name	Status (Fed / State / CNPS)	Potential to be Present/Notes
			Brawley (Patten et al. 2003).
Bald eagle	*Haliaeetus leucocephalus*	D / E+FP / –	Moderate. Seacoasts, rivers, swamps, large lakes; winters at large bodies of water in lowlands and mountains. This species is a rare winter visitor. Bald eagles forage over open water and could utilize the Project area for foraging. No suitable nesting areas are within the Project area. One juvenile observed near the New River in June 2010 surveys (Dudek 2010) was likely a transient.
American peregrine falcon	*Falco peregrinus anatum*	D / E+FP / –	Moderate. Nests on cliffs, buildings, bridges; preys on birds over wetlands, riparian, meadows, and croplands, especially where waterfowl are present. The species is a rare perennial visitor in both summer and winter but is not likely to breed within the Project area due to lack of suitable cliff areas. Suitable foraging areas within the Project area include agricultural land, marshes, mudflats, and open scrub habitats. Observed on two occasions near the New and Alamo rivers during surveys in July 2010 (Dudek 2010). Three individuals were observed flying over a mudflat near the Alamo River on one occasion. These observations could indicate nesting nearby or dispersal movements.
California brown pelican	*Pelecanus occidentalis californicus*	D / D+FP / –	High. Dispersing juveniles and post-breeding adults from Baja California forage around the Salton Sea's margins in summer. Over 5,000 individuals were observed in 2005 and 2006 (DWR and DFG 2007). A few have nested, primarily at the southern end of the Sea at the Alamo River mouth (Molina and Sturm 2004). The species was observed foraging over the Sea at the mouths of the New and Alamo rivers and along the shoreline during Summer 2010 surveys (Dudek 2010).
Least bittern	*Ixobrychus exilis*	– / SSC / – (breeding)*	High. Dense emergent wetland vegetation, sometimes interspersed with woody vegetation and open water. Has been recorded as breeding in the Salton Sea and surrounding areas especially in association with the rivers and irrigation ditches (Patten et al. 2003). It is considered a fairly common breeder at the Salton Sea, breeding near the Whitewater River mouth and at the Sea's southern end, at IWA's Wister Unit, as well as Fig Lagoon (Shuford and Gardali 2008). The species was recorded during 2009 marsh surveys conducted by Sonny Bono NWR (USFWS 2010b) and DFG on IWA's Wister Unit (DFG 2009); a total of six and nine individuals, respectively, were recorded but the locations were not mapped. Surveys during 2010 recorded 10 detections (DFG 2011a). Observed during Summer 2010 surveys in marshes adjacent to the Alamo River (Dudek 2010).
Wood stork	*Mycteria americana*	– / SSC / – (post-breeding)*	High. Shallow, relatively warm waters where it forages for fish and other vertebrate prey. Nests colonially. Based on observations of the species in the Salton Sea region, the wood stork occurs as an uncommon post-breeding visitor that is observed regularly every year (Patten et al. 2003). Limited to the Sea's southern and southeastern shores, along the lowermost portions of the Alamo River delta and adjacent shoreline north to IWA's Wister Unit (Shuford and Gardali 2008). Observed during Summer 2010 surveys along the Alamo River

Table 3.4-4 Special-Status Species Potentially Affected by the SCH Project

Common Name	Scientific Name	Status (Fed / State / CNPS)	Potential to be Present/Notes
			(Dudek 2010).
Greater sandhill crane	*Grus canadensis tabida*	– /T+FP / –	Low. The subspecies is an uncommon winter visitor but occurrences have been increasing in recent times (Patten et al. 2003). Habitat is same as described for the lesser sandhill crane.
Lesser sandhill crane	*Grus Canadensis Canadensis*	– / SSC / – (wintering)*	Moderate. Pastures, moist grasslands, alfalfa fields, and shallow wetlands for loafing sites during winter. Omnivorous; forages for invertebrates, small mammals, waste grains, and seeds (Shuford and Gardali 2008). Salton Sea region hosts the only regularly wintering cranes south of the Central Valley. Most of the cranes observed in the Imperial Valley are lesser sandhill cranes (Patten et al. 2003). In 2009, a crane roost (not determined if it was the lesser or greater subspecies) was documented at the Sea in Unit 1 of Sonny Bono NWR (USFWS 2010c). Uses of the fields and roost locations vary and are unpredictable because the species is nomadic and may randomly use the Project area where habitat is suitable.
California black rail	*Laterallus jamaicensis coturniculus*	– /T+FP / –	Low. Saline, brackish, and fresh emergent wetlands, especially cattail and bulrush, with a thick understory and moist mud or a thin veil of water but may also occur where tamarisk and common reed are. It was recorded at Calipatria, Finney Lake, Whitewater River, and Salt Creek but has not been detected at these locations since the 1980s. Several individuals were detected at the mouth of the New River in 1989, but none were detected in later surveys (Shuford et al. 2000). Although this species is expected to be present as a resident within the Salton Sink, it may only be sporadic (Patten et al. 2003). It was not recorded within the 2009 marsh surveys conducted by Sonny Bono NWR (USFWS 2009) or by DFG on IWA's Wister Unit in 2010 (DFG 2011a). The species was recorded by DFG on the Wister Unit in 2009 but was not mapped (DFG 2009). Recorded in CNDDB for marsh habitat in upstream portions of the Alamo River near Calipatria.
Yuma clapper rail	*Rallus longirostris yumanensis*	E / T+FP /–	High. Freshwater marsh. Prefers stands of cattails and tules dissected by narrow channels of flowing water. CNDDB records from 1978 near the mouths of the Whitewater and New rivers. Also a CNDDB record from 1990 northeast of the Alamo River mouth. Recent surveys for this species indicate it is found in Sonny Bono NWR marshlands (96 detections; USFWS 2009). On IWA's Wister Unit 191 birds were detected in 2009, and 132 locations had positive detections in 2010 (DFG 2009; DFG 2011a). Detected twice during Summer 2010 surveys in freshwater marsh areas adjacent to the Alamo River (Dudek 2010).
Mountain plover	*Charadrius montanus*	– / SSC / – (wintering)*	High. Winters in shortgrass plains, plowed fields, open sagebrush, and sandy deserts. A large proportion of the North American wintering population occurs in the Imperial Valley with as many as 3,700 individuals occurring there (Patten et al. 2003; Shuford and Gardali 2008). The species does not breed in the region and is strictly present during the winter where it forages for invertebrates in barren fields, freshly plowed agricultural lands, and burned agricultural fields. CNDDB records within agricultural fields near the New and Alamo

Table 3.4-4 Special-Status Species Potentially Affected by the SCH Project

Common Name	Scientific Name	Status (Fed / State / CNPS)	Potential to be Present/Notes
			rivers. The species is nomadic and has also been recorded near the mouth of the New River and at Red Hill (Patten et al. 2003).
Western snowy plover (Interior populations)	*Charadrius alexandrinus nivosus*	– / SSC / – (breeding)*	High. Nests primarily in flat open areas, with sandy or saline substrates; less commonly in salt pans, dredged spoil disposal sites, dry salt ponds, and levees. Occurs year-round at the Salton Sea (Shuford and Gardali 2008).The Programmatic Environmental Impact Report (DWR and DFG 2007) noted this species uses the Salton Sea for breeding and wintering. Surveys estimated 221 breeding adults at the Sea in 1999 (Shuford and Gardali 2008). Observed during Summer 2010 surveys along the Sea's shoreline adjacent to Bruchard Bay (Dudek 2010).
Gull-billed tern	*Gelochelidon nilotica*	– / SSC / – (nesting)*	High. Forages over many habitats including fresh and saline emergent wetlands, lakes, mudflats, croplands, grasslands, and, rarely, brushlands. Nests in small colonies on the ground in areas typically devoid of vegetation; may nest immediately adjacent to the shoreline. Salton Sea is the only interior nesting site for gull-billed terns in western North America north of Mexico (Molina 2004).CNDDB records from 1994 and 1998 near the mouths of the Whitewater and Alamo rivers. Observed during Summer 2010 surveys at Sonny Bono NWR and at the USGS ponds near the Alamo River (Dudek 2010). Between 1992 and 2001 approximately 72 to 155 breeding pairs were present. Currently, approximately 65 to 200 breeding pairs are at the Salton Sea (personal communication, K. Molina 2010).
Black skimmer	*Rynchops niger*	– / SSC / (breeding)*	High. Breeds at the Sea's northern and southern ends with variable reproductive success (Shuford and Gardali 2008). Nest on the ground on sandy islands or sandy areas in salt marshes. Prefer islands with fine homogeneous substrates and no vegetation. The Salton Sea is the only interior nesting site for black skimmers in western North America north of Mexico (Molina 2004). Roosting takes place on sandy beaches or gravel bars. Rarely alights on water. Forage for fish by skimming the water surface. Observed during Summer 2010 surveys along the New and Alamo rivers and also nesting on the islands of Sonny Bono NWR (Dudek 2010).
Burrowing owl	*Athene cunicularia*	– SSC / – (breeding)*	High. Uses grassland, lowland scrub, agricultural fields, and other artificial open areas. Requires burrows or equivalent and friable soils. Often burrows into berms associated with irrigation ditches. Sizeable breeding populations are in agricultural areas in Imperial Valley (Shuford and Gardali 2008). Foraging areas typically include agricultural fields and grasslands. Observed several times near the Project area (Dudek 2010) including along Bruchard Road adjacent to Bruchard Bay and along Hatfield Road north of Estelle Road.
Gila woodpecker	*Melanerpes uropygialis*	– / E / –	Low. Cottonwood and other desert riparian trees, shade trees, and date palms. Cavity nester in riparian trees and saguaro cactus. Has been recorded as a breeding bird in Imperial and Coachella valleys and became established with the planting of large trees as the region was settled in the 1930s. It is rarely observed north of Calipatria but has been recorded at IWA's Wister Unit (Patten et al. 2003). The

Table 3.4-4 Special-Status Species Potentially Affected by the SCH Project

Common Name	Scientific Name	Status (Fed / State / CNPS)	Potential to be Present/Notes
			species has been recorded anecdotally by birding groups such as Sea and Sage Audubon in 2009 and 2010; however, locations were not recorded (Sea and Sage Audubon 2010).
Little willow flycatcher	*Empidonax traillii brewsteri*	– / E / –	High. Riparian woodlands along streams and rivers with mature, dense stands of willows or alders; may nest in thickets dominated by tamarisk. Within the Project area, suitable habitat for the species includes tamarisk scrub and woodland. Most observations of the species are from mid-May through the first half of June. Salton Sea riparian areas may be important for migratory stopover. A total of 27 individuals were observed during 2010 surveys along both the New and Alamo rivers within tamarisk riparian habitat (Dudek 2010).
Crissal thrasher	*Toxostoma crissale*	– / SSC / – (year-round)*	Low. Uses dense thickets of shrubs or low trees in desert riparian and desert wash habitats; also, dense sagebrush and other shrubs in washes within juniper and pinyon-juniper habitats. Increasingly local and uncommon breeder in the Salton Sea area (Shuford and Gardali 2008). Suitable habitat within the Project area is desert riparian and wash habitats and could occur within the screwbean mesquite bosque or, less likely, within the tamarisk scrub and woodland. CNDDB records for the mouth of the Alamo River (1930, 1952, 1969), and in an upstream portion of the New River (Patten et al. 2003).
Loggerhead shrike	*Lanius ludovicianus*	– / SSC / – (breeding)*	High. Open ground including grassland, coastal sage scrub, broken chaparral, agricultural fields, riparian, open woodland. Fairly common at the Salton Sink during the breeding season and numerous in winter (Shuford and Gardali 2008). Suitable habitat within the Project area includes arrow weed thickets, desert holly scrub, iodine bush scrub, quailbush scrub, screwbean mesquite bosque, tamarisk scrub, and tamarisk woodland. Several individuals were observed on numerous occasions during Summer 2010 surveys (Dudek 2010) within tamarisk trees and mesquite adjacent to the Alamo River and most commonly adjacent to the Sea's shoreline within low stature tamarisk scrub or perching on dead snags while foraging.
Yellow-breasted chat	*Icteria virens*	– / SSC / (breeding)*	Moderate. Breed and forages within dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush. The species was formerly a common breeding bird but fewer numbers are recorded in the past 10 years (Patten et al. 2003). Suitable habitat within the Project area includes the tamarisk scrub and woodland and screwbean mesquite bosque. In the 1990s up to six breeding pairs were known at four sites at the Salton Sea including at IWA's Wister Unit, two locations at the New River (near Brawley and Fig Lagoon), and the Whitewater River (Shuford and Gardali 2008). Observed during Summer 2010 surveys along the New River, potentially breeding (Dudek 2010).
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	– / SSC / – (breeding)*	Moderate. Nests in freshwater emergent wetlands with dense vegetation (cattails, common reed) and deepwater. Often along the borders of lakes or ponds. Common breeding bird at the Salton Sea (Patten et al. 2003). Observed on several occasions during the

Table 3.4-4 Special-Status Species Potentially Affected by the SCH Project

Common Name	Scientific Name	Status (Fed / State / CNPS)	Potential to be Present/Notes
			Summer 2010 surveys in marsh areas adjacent to the Alamo River and also while foraging within tamarisk or mesquite (Dudek 2010).
Large-billed savannah sparrow	*Passerculus sandwichensis rostratus*	– / SSC / – (nonbreeding)*	High. Saltmarsh, with pickleweed for breeding, and uses low shrub habitat dominated by iodine bush, saltbush, and young tamarisk during the nonbreeding season. Forages on barnacle beaches and rock outcrops at the shoreline. This subspecies is a fairly common post-breeding fall and winter visitor to the region occurring adjacent to the Sea's shoreline (Patten et al. 2003; Shuford and Gardali 2008). Observed at Obsidian Butte and near mouth of New River.
Mammals			
American badger	*Taxidea taxus*	– / SSC / –	Low. Dry, open treeless areas, grasslands, coastal sage scrub. It also occurs in drier open stages of most shrub, forest, and herbaceous habitat and especially requires friable soils for digging its burrows and foraging for its fossorial food. Although such habitat is not present within the Project area, very sandy friable soils are present along the New and Alamo rivers and the desert holly scrub, iodine bush scrub, quailbush scrub, and tamarisk scrub may provide the required habitat for this species if suitable soils are present. CNDDB record from 1937 within the Alamo River delta. No observations of the species or signs of foraging were observed in 2010 (Dudek 2010).
Western yellow bat	*Lasiurus xanthinus*	– / SSC / –	Low. Desert and montane riparian, desert succulent scrub, desert scrub, and pinyon-juniper woodland. Foraging may occur almost anywhere. Roosts in trees and primarily in palm trees; appears to prefer the dead fronds of palm trees. Could roost in tamarisk scrub and tamarisk woodland along the New and Alamo rivers. CNDDB record from 1976 southwest of the Whitewater River mouth and within the New River area near Brawley.

Notes:

* "Season of concern" as addressed for SSC species by Shuford and Gardali (2008)

Federal Designations:

D Delisted; monitored for 5 Years

E Endangered

State Designations:

SSC Species of Special Concern

FP Fully Protected Species

E Endangered

T Threatened

D Delisted

Plants

A search of the CNDDB for each of the United States Geological Survey (USGS) quadrangle maps within the study area and adjacent USGS quadrangle maps was conducted (CNDDB 2010) to determine a list of special-status plant species that could be affected by the SCH Project. All plant species that were state or

Federally listed in addition to plants on CNPS lists 1B (rare, threatened, and endangered in California and elsewhere) and 2 (rare, threatened, or endangered in California, but more common elsewhere) were included in this analysis (Appendix H). Each species was evaluated for likelihood of occurrence in the Project area and the necessity for conducting species-specific surveys. From this analysis, it was determined that no state or Federally listed or other special-status plant species are anticipated to occur within the area affected by the SCH Project. In addition, the likelihood of occurrence of other special-status plant species was so low as to make surveys unnecessary.

Aquatic Species

The only special-status aquatic species at the Salton Sea is the desert pupfish, which is also the only native fish in the Salton Sink. Desert pupfish are state and Federally listed as endangered, primarily as a result of habitat loss (e.g., dewatering of springs), pollution, and introduction of exotic species that either prey upon desert pupfish or compete for available resources (Marsh and Sada 1993).

Prior to formation of the modern Salton Sea, desert pupfish inhabited Salt Creek, San Felipe Creek, and several springs that were subsequently flooded by the Sea. Desert pupfish persist today in both creeks, as well as other tributaries to the Sea, and have become established in the terminal sections of agricultural drains that flow directly to the Salton Sea on the southern and northern shores, as well as in the Sea's shallow water margins. Desert pupfish are observed most frequently in shallow water less than about 1 foot (30 centimeters) deep with velocities less than about 1 foot/second (Black 1980, as cited in DWR and DFG 2007). They apparently are capable of moving freely between the relatively fresh water in the agricultural drains and the highly saline environment in the Salton Sea (DWR and DFG 2007).

Desert pupfish are very tolerant of extreme water quality conditions, and have been held in the laboratory in water with salinity greater than 98 ppt (Barlow 1958 as cited in Moyle 2002). The ability of desert pupfish to tolerate high salinity, high pH, and low DO apparently contributes to their ability to persist at the Salton Sea. Martin and Saiki (2005) suggested that desert pupfish abundance in Salt Creek and several agricultural drains is generally highest in areas where water quality extremes seemingly limit the occurrence of other fish. Currently, the relatively high salinity and water quality dynamics of the Salton Sea limit some of the fish that prey upon desert pupfish, especially now that the marine sport fish are apparently absent (DWR and DFG 2007).

Moyle (2002) summarized the life history of desert pupfish as follows, with additional information as noted. This species can tolerate salinities ranging from fresh water to considerably greater than seawater (up to 68 ppt in the wild), DO from saturation to as low as 0.1 to 0.4 milligrams per liter (=parts per million), and temperatures from 39.9 degrees Fahrenheit (°F) (4.4 Celsius [°C]) in winter (Schoenherr 1990) to 108.3°F (42.4°C) in summer (Carveth et al. 2006). Individuals can survive daily temperature fluctuations of up to 78.8°F (26°C) and salinity changes of 10 to 15 ppt. Desert pupfish tend to swim in groups called shoals that contain fish of similar size and age with smaller fish in shallower water than larger fish. In the Salton Sea, fish avoided high temperatures (above 36°C) by moving into deeper water during the warmer parts of the day. Pupfish feed on algae and small invertebrates on the bottom and ingest detritus as well. They occasionally feed on their own eggs and young. Desert pupfish grow rapidly, and some can reach maturity at a standard length of 0.6 inch (15 millimeters) although most do not breed until they reach 1.2 to 2.0 inches (30 to 50 millimeters) in length. Spawning occurs when temperatures are above 68°F (20°C), generally from April through October. Males are territorial during breeding and set up and defend territories for spawning. The eggs hatch in 10 days at 68°F (20°C). Larvae have a higher salinity tolerance (up to 90 ppt) than do adults (68 ppt) and can withstand sudden salinity changes of up to 35 ppt. Desert pupfish generally do not live more than 2 years.

Under current conditions at the Salton Sea, individual desert pupfish inhabiting creeks and drains that flow into the Sea are presumed to move along the Sea's margins and among drains. This movement

provides the opportunity for genetic exchange among desert pupfish subpopulations and reduces the potential deleterious effects of isolation of individual populations. It also provides the opportunity to recolonize these same areas in the event a local population is extirpated (DWR and DFG 2007).

Under No Action, the Salton Sea would become too saline to support desert pupfish by about 2020. After that, desert pupfish would become isolated in the drains, creeks, and river outflows, which would prevent genetic exchange among the isolated populations and prevent recolonization following local extirpations.

Terrestrial Species

The species to be addressed in the impact analysis are listed in Table 3.4-4. Those described in greater detail below are located within or in close proximity to the Project area.

Western Snowy Plover. The western snowy plover is a small shorebird that regularly winters and breeds along the Sea's shoreline. The wintering population is the largest in interior western North America (Shuford et al. 2000). It nests during the spring and summer on open beaches with sand and barnacle substrates and in close proximity to standing water. The western snowy plover also forages along the Sea's shoreline, mostly on the sand and barnacle beaches. It will also forage in shallow impoundments with exposed mud. The Salton Sea is the most important wintering site for the western snowy plover in the interior of western North America, and the subspecies is more common year-round at the Sea than anywhere else within its range, except for the Great Salt Lake (Patten et al. 2003). Suitable habitat for foraging and breeding within the Project area includes the mudflats along the Sea's shoreline. In 2009, the western snowy plover was most abundant in February and occurred in smaller numbers in the winter and early spring (USFWS 2010b). Individuals currently forage in mudflat areas that surround Morton Bay, are along the edge of the Alamo River, are between Bruchard Bay and Unit 1, and are adjacent to the eastern side of the New River north to Young Road. Several individuals were observed during summer 2010 surveys along the shoreline adjacent to Bruchard Bay, but it was not confirmed that they were nesting (Dudek 2010). Nesting occurs within approximately 1,000 feet of the Sea's edge (personal communication, K. Molina 2010). Breeding has been noted to be concentrated on the Sea's western side from Desert Shores to the mouth of San Felipe Creek and on the eastern side from Bombay Beach to IWA's Wister Unit (Patten et al. 2003).

Little Willow Flycatcher. Willow flycatchers were observed between May and July in the Project area (Dudek 2010). They were generally observed within patches of tamarisk that were more than just a linear string of trees along the New and Alamo rivers within the survey area of each river as well as in a patch of habitat located south of the New River. No willow flycatchers were observed during the third survey period of the focused survey protocol (Sogge et al. 2010). Thus, it was concluded that the observed willow flycatchers were not the southwestern willow flycatcher subspecies, which is Federally listed as endangered. It was concluded that the subspecies observed is not breeding within the study area. The willow flycatcher that was observed during this focused survey could be either one of the other subspecies of willow flycatcher that breed elsewhere. Based on the discussion of the occurrence of the various subspecies of willow flycatcher in Patten et al. (2003) and the dark plumage of the individuals that were detected, the subspecies occurring in this region is likely the little willow flycatcher (*E. t. brewsteri*) (Patten et al. 2003). In support of this conclusion, the southwestern willow flycatcher does not normally stop while migrating between its nesting locations and the international border; hence, it would be unlikely to occur within the Project area (Patten et al. 2003). The region may be an important winter stopover location for the little willow flycatcher subspecies because it has been documented to be the most common flycatcher migrant in the Salton Sea region (Patten et al. 2003).

Gull-Billed Tern. Gull-billed terns nest on protected spits, berms, and islands composed of sand or barnacle shells; at the Salton Sea, they also nest on earthen levees and on constructed islands in shallow brackish impoundments. For Salton Sea colonies, available nesting substrates include fine, poorly

drained, clay soils devoid of all vegetation with cobbles and boulders located sparsely. Nests are often located adjacent to cobbles, boulders, or other debris. Gull-billed terns forage primarily in freshwater ponds and flooded agricultural fields. They are fairly common breeders at the Salton Sea, which is considered the breeding stronghold for this species in the western United States. Approximately 25 percent of the entire subspecies nests at the Salton Sea; approximately 80 percent of the U.S. population breeds at Salton Sea (Molina 2004). They arrive at the Salton Sea in mid-March and remain until October. Foraging habitat within the Project area would likely include agricultural fields, marshes, mudflats, drainage ditches, and fresh or saline open water. At the Salton Sea, the species forages for small fish, crayfish, lizards, butterflies, beetles, crickets, weevils, and occasionally, the young chicks of other birds. In 1999, 101 nesting attempts were recorded, 57 on the Sea's northern end near Johnson Street and 44 at Rock Hill on the southern shore (Shuford et al. 2000). In 2009, gull-billed terns were observed between April and July within the Project region and were most abundant in July with almost 200 individuals recorded, predominantly at Morton Bay and Mullet Island (personal communication, K. Molina 2010).

Yuma Clapper Rail. While the other clapper rail subspecies are species of tidal marine estuaries, the Yuma clapper rail occurs in heavily vegetated freshwater marshes with nearly monotypic patches of cattail, but also may occur in dense stands of common reed where it forages primarily for crayfish. This subspecies breeds only in the lower Colorado River Valley and in the Salton Sink, which supports approximately 40 percent of the U.S. population (Shuford et al. 2000). Suitable habitat within the Project area includes cattail marsh and common reed marsh. Scattered locations of the Yuma clapper rail are known north of the Project area near the Whitewater River delta, and a CNDDB record exists from 1990 northeast of the Alamo River confluence. More recently, the principal locations are IWA's Wister Unit, Unit 1 of Sonny Bono NWR, and the marshes around the New and Alamo rivers. The 2009 marsh surveys conducted by Sonny Bono NWR detected a total of 96 Yuma clapper rails (USFWS 2010b). Approximately 26 were recorded in the Hazard Ponds, 1 was recorded at the Alamo River, 1 was recorded at Union Pond, 4 were detected at Bruchard Bay, approximately 30 were recorded in Unit 1, and approximately 25 were detected in the Reidman and Trifolium locations. On IWA's Wister Unit, 191 birds were detected in 2009; however, detailed mapping was not provided. In 2010, 132 locations had positive detections on the Wister Unit (DFG 2009; DFG 2011b). Over one-half of these positive locations were north of Beach Road, 6 were south of Beach Road and west of Davis Road, and 12 were between Noffsinger Road and Alcott Road. During summer 2010 surveys, the Yuma clapper rail was detected twice near the Alamo River mouth (Dudek 2010).

Black Skimmer. Black skimmers are relatively recent arrivals to California and were first observed at the Salton Sea in 1968. They are now a fairly common breeder at the Sea with approximately 40 percent of the California breeding population (Ornithological Council 1988). The Sea is the only interior nesting site for black skimmers in western North America north of Mexico (Molina 2004). They seldom overwinter. They typically nest on sandy islands or sandy areas in salt marshes and they can also nest on isolated sections of eroded impoundment levees. Nesting habitat usually has little vegetative cover (<30 percent) with adequate protection from predators; areas with encroaching vegetation were rendered unsuitable for nesting. Shallow water near nest sites is required to soak their bellies to aid in cooling their eggs. Colonies choose areas where the chance of terrestrial predators is minimal. Black skimmers forage on small fish in calm, shallow waters around the Sea. From 1990 to 2000, the Salton Sea breeding population ranged between 80 and 487 pairs, with a mean of 360 pairs between 1992 and 2001. In 1999, 377 breeding pairs were recorded at Rock Hill at the Sea (Shuford et al. 2000). They also nest at the Sea near the Whitewater River delta, various locations on the southern shoreline, and near Salton City. In 2009, black skimmers were observed between May and October and were most abundant in August with approximately 150 individuals recorded near and within the Project area (USFWS 2010b). Near the Project area, this species has been recorded breeding at Sonny Bono NWR. Colonies usually include approximately 50 nests. Suitable breeding areas within the Project area for this species include Mullet Island and sandbars. They seldom overwinter.

California Brown Pelican. The California brown pelican occurs at the Salton Sea as newly fledged young and post-breeding adults as they disperse from nesting areas in Baja California. During summer, brown pelicans forage around the Sea's margin. Since the mid 1990s, single day counts have reached 2,000 individuals (Shuford et al. 2000) and probably exceed 3,000 (Patten et al. 2003). Peak numbers of brown pelicans detected during surveys in 2005 and 2006 were over 5,000 birds (DWR and DFG 2007). In recent years, brown pelicans have nested in small numbers, especially at the Sea's southern end at the mouth of the Alamo River (Molina and Sturm 2004). In 2009, California brown pelicans were most abundant in August with almost 3,000 individuals recorded near and within the Project area; numbers declined in the fall but the species remained a consistent visitor throughout the year (USFWS 2010b). This species was observed during summer 2010 surveys foraging within the Sea at the mouths of the New and Alamo rivers and along the shoreline (Dudek 2010); suitable roosting and loafing habitat includes sandbars, islands, and rocky areas within the Project area.

3.4.4 Impacts and Mitigation Measures

3.4.4.1 Impact Analysis Methodology

Impacts on biological resources were assessed in several ways. Direct effects on special-status species, riparian areas, wetlands, and colonial bird nesting were evaluated by estimating the amount of habitat that could be affected by Project construction activities and comparing it to the amount of that habitat present in the area. The seasonal abundance of special-status species and their use of the affected habitat were also considered in the analysis. In addition, the effects of noise, human presence, lighting, turbidity, and other construction-related disturbances were assessed through scientific judgment of the preparers, unless specific tolerances of individual species were known. Effects of Project construction on wildlife movement or migratory corridors was qualitatively evaluated based on known or expected movement pathways and Project information. Impacts of Project operation and maintenance were assessed by evaluating how planned activities could interact with anticipated development of biological resources in the restored habitat, or could change exposure to contaminants such as selenium and pesticides. A desktop analysis of wetlands and other Waters of the U.S. was conducted by overlaying project vegetation maps and maps of pond locations along with assumptions of additional areas that would be disturbed, such as diversions in rivers. For the purpose of this analysis, areas mapped as marsh were assumed to be wetlands and areas mapped as open water were assumed to be Waters of the U.S.

3.4.4.2 Thresholds of Significance

Significance Criteria

Impacts would be significant if the Project alternatives would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as listed (or proposed or candidate) as threatened or endangered by the DFG or USFWS, or identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the DFG or the USFWS;
- Have a substantial adverse effect on Federally protected wetlands as defined by CWA through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife breeding or nursery sites;

- Have a substantial adverse effect on common native plant communities, fish (native and nonnative), or wildlife species either directly or through habitat modification;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved, local, regional, or state habitat conservation plan.

Application of Significance Criteria

The following summarizes the overall methodology used in applying the applicable significance criteria to the Project alternatives:

- **Substantially affect special-status species, riparian habitat, or wetlands** – The Project footprint was overlaid onto GIS maps of these biological resources to determine the amount of habitat affected. For effects of construction activities (e.g., noise, lighting, turbidity) on special-status species, a buffer around the Project footprint of 500 feet was used. No special-status plant species occur in the Project footprint or surrounding buffer area and, therefore, no impacts on those species would occur. For this reason, special-status plant species are not discussed in the following impact analysis.
- **Substantially interfere with wildlife movement or breeding/nursery areas** – Known or anticipated movement corridors for fish and wildlife were compared to locations of Project features and activities (construction and operation/maintenance) to determine potential for interference with movement. For impacts on breeding/nursery areas, the Project footprint was overlaid on a map of known locations for these areas.
- **Substantially affect native plant communities, fish (native and nonnative), or wildlife species** – Known locations of native plant communities and wildlife (excluding special-status species, wetlands, and riparian habitats) were identified on Project maps, and the potential for a substantial effect was assessed qualitatively for fish and wildlife and quantitatively for plant communities. Selenium's pathways and concentrations were modeled to assess impacts on birds (Sickman et al. 2011; Appendix I, Selenium Management Strategies). Pesticide concentrations in sediment were measured at different depths (Wang et al. 2011; Appendix J, Summary of Special Studies), and site-specific concentrations were calculated for each alternative (Cardno ENTRIX 2011, unpublished data). The calculated concentrations were then compared to sediment screening criteria for protection of the invertebrate community (MacDonald et al. 2000, CRBRWQCB 2010) as well as individual adult birds and eggshell thinning (Poulsen and Peterson 2006) to assess potential ecological impacts.
- **Conflict with local policies or ordinances –** Compliance with the local policies and ordinances is discussed under land use and, therefore, is not considered in this section.
- **Conflict with an approved HCP or NCCP –** IID is in the process of developing an HCP and NCCP covering water conservation activities and delivery and drainage of irrigation water within portions of its service area in Imperial Valley. This plan is not yet approved, and no other HCPs or NCCPs apply to the Project area. Because no approved plans are in place, this criterion was not addressed in the impact analysis.

3.4.4.3 No Action Alternative

Habitat Changes

Under the No Action Alternative, a number of physical and chemical habitat changes would occur in the Project area between 2010 and 2025, and beyond. Physical changes include loss of islands and snags, a reduction in amount of shoreline, and decreased water depth in the Salton Sea. The primary chemical

change will be the continued increase in the Sea's salinity. Both the physical and chemical changes will alter the biological resources present.

As described in the Programmatic Environmental Impact Report (DWR and DFG 2007), a number of activities would occur at the Salton Sea from 2010 to 2025 unrelated to the SCH Project. Sedimentation/distribution basins, air quality management measures, and pupfish channels would be constructed, operated, and maintained. The pupfish channels would allow them to move between the drains until conditions in the Sea can no longer support desert pupfish. Under the QSA and California Fish and Game Code, IID must convey water into the Salton Sea until 2017 to mitigate some of the adverse impacts caused by transfer of water from IID to San Diego County Water Authority. Until 2018, surface water elevations in the Salton Sea would decline due to factors unrelated to the QSA from the existing elevation of about -228 feet msl to -235 feet msl, and salinity would continue to increase from the current level of about 51 ppt to 60 ppt. After 2018, inflows and the Sea's surface water elevation would decline more rapidly and salinity would increase. By 2078, the water elevation would be about -260 feet msl and salinity would exceed 300 ppt. The surface water area would decline from the existing 230,000 acres to 213,000 acres in 2018 and 140,000 acres by 2078, resulting in a substantial decrease in the amount of shoreline habitat. The drains and river outflows would extend across the exposed Seabed to reach the receding Sea.

Vegetation

Upland vegetation adjacent to the existing Salton Sea would change very little under the No Action Alternative. As the Sea recedes, plants such as tamarisk, salt bush, iodine bush, and other salt-tolerant species would likely sparsely colonize the exposed Seabed. Air quality management activities, however, would likely establish vegetation to stabilize the exposed sediments. Outflows from drains and rivers would create channels that extend across the exposed bed to the Salton Sea, and vegetation would establish along these channels. The types of plant communities that establish along these channels would depend on species tolerance to salinity and are expected to consist of tamarisk and common reed along the rivers and tamarisk or cattails along the drains.

Aquatic Biota

The Sea's changing chemical characteristics, and particularly the increasing salinity, would affect planktonic organisms and benthic invertebrate communities from phytoplankton to larger organisms. As the salinity tolerance level for individual species is exceeded, those species would die out until only species with higher tolerances remain. Thus, the species composition and abundance of common phytoplankton and invertebrates would change over time. Phytoplankton, and to a greater extent invertebrates, provide forage for fish and some species of birds. Changes in species composition and abundance of these organisms could affect food availability for at least some species of birds if their preferred food is no longer available.

Fish populations in the Sea would change with increasing salinity. Tilapia would no longer be present in large numbers when salinity exceeds 60 ppt (prior to 2020). Small numbers, however, are likely to remain in less saline water where drains and the rivers enter the Sea. They would also continue to be present in the drains. Although tilapia are an introduced species that is not native to this region, a substantial reduction in their population would cause a substantial effect on the Sea's bird use. Sailfin mollies could persist in the Sea until salinity reached about 87 ppt (Moyle 2002), if other water quality parameters remain within their tolerance. Freshwater fish populations in the New and Alamo rivers, as well as in the drains, would show little change. These species would also be present in the pupfish channels and sedimentation/distribution basins.

Desert pupfish would remain in the Sea until salinity exceeds approximately 68 ppt (in about 2025) and then would be restricted to the drains and tributaries where present at that time. This restriction would result in isolation of populations and loss of habitat.

Wildlife

The decline and ultimate loss of open water fish populations, and particularly tilapia, would reduce and possibly eliminate use of the Salton Sea by piscivorous birds such as pelicans, double-crested cormorants, and black skimmers by the early 2020s. Some of these birds could use areas where the rivers, creeks, and drains enter the Sea if fish continue to persist in these locations, as well as the sedimentation/distribution basins. The number of species and relative abundance of individuals that forage on invertebrates at the Sea likely would change over time as a result of changes in the invertebrate community.

Snags used for bird roosting and nesting in the Salton Sea would disappear by 2020 as the Salton Sea recedes and the snags break and collapse due to degradation by wind, brine, and time. Mullet Island would cease to be protectively surrounded by water. The loss of snags and Mullet Island could limit nesting opportunities for several species of colonial nesting birds, including herons and egrets.

As the Salton Sea recedes in future years, the distance between the shoreline and freshwater wetlands (Sonny Bono NWR, IWA, and duck clubs) and agricultural lands adjacent to the present Salton Sea would increase, possibly changing the level of bird use at the Sea. Air quality management activities would increase human presence in areas where vegetation is planted and maintained, which could disturb shorebirds adjacent to the work areas. Use of equipment for air quality management could startle birds using the shoreline and open water, resulting in stress and expenditure of energy.

Contaminants

Selenium occurs in the Salton Sea's water and sediment, and has the potential to bioaccumulate and adversely affect fish and wildlife (DWR and DFG 2007), as discussed in Appendix I, Selenium Management Strategies. Selenium's most substantial effects occur in bird embryos, such as increased risk of reduced hatching success and teratogenesis (embryo deformities) at higher concentrations. The responses to selenium vary among bird species, ranging from "sensitive" (e.g., mallard) to "average" (e.g., black-necked stilt) and "tolerant" (e.g., avocet) (Skorupa 1998, as cited in Ohlendorf and Heinz 2011). Cormorants and terns are likely to be fairly tolerant of selenium in keeping with greater tolerance of other saltwater-adapted species, such as avocets and snowy plover, compared to freshwater-adapted species, such as mallards (personal communication, H. Ohlendorf 2010). Risk of impaired reproduction can start to occur at egg concentrations of 6-12 micrograms per gram (µg/g) dry weight (dw). The risk of teratogenesis starts to occur above 12 µg/g dw for sensitive species and above 20 µg/g dw for moderately sensitive species (Ohlendorf and Heinz 2011).

Under the No Action Alternative, selenium concentrations in bird eggs in the area would be similar to existing levels in the area. Mean concentrations measured in eggs from several sites varied: Salton Sea shallow water and estuary sites (means 2.8-5.98 µg/g dw [range 1.9 - 14.2 µg/g dw]), a freshwater marsh northeast of Morton Bay near Pound Road (means 5.6-7.05 µg/g dw), and Sonny Bono NWR (means 2.18-4.42 µg/g dw) (DWR and DFG 2007, Appendix F; Miles et al. 2009). A large percentage (39 percent) of eggs from the freshwater marsh site and Morton Bay exceeded 6 µg/g dw, but these egg selenium concentrations apparently did not affect embryo malpositioning in such a way that would affect hatchability (Miles et al. 2009).

Other contaminants of concern are pesticides, and organochlorine pesticides are the predominant type in sediments near the Alamo and New rivers (see Section 3.11.3.2, Surface Water Quality; Wang et al. 2011; Appendix J, Summary of Special Studies). The concentration of most pesticides was well below

detectable levels, but dichlorodiphenyltrichloroethane (DDT) and its metabolites represented more than 80 percent of the total concentration of organochlorine pesticides detected in Salton Sea sediments, with dichlorodiphenyldichloroethylene (DDE) as the most abundant derivative. Because the use of DDT has been banned in the U.S. for decades, these are assumed to be legacy contaminants.

Of the current-use pesticides evaluated, bifenthrin was the most commonly detected pyrethroid and was found at concentrations up to 26 nanograms per gram (ng/g) (Wang et al. 2011). Some of the air-exposed sediments contained bifenthrin at levels exceeding the 10-day median lethal concentration for *Hyalella azteca* (an aquatic isopod) of 4.5 ng/g dw. However, based on the relative sensitivity of *H. azteca* to pyrethroid exposure, the potential toxicity of these sediments to the invertebrate taxa that occur in the Salton Sea is likely overestimated (Ding et al. 2010).

Current DDE concentrations in surface sediments (0 to 5 centimeters deep) represent undisturbed existing conditions and the No Project Alternative. Mean DDE concentrations in these sediments were 1.14 to 6.52 ng/g near the New River and 13.41 to 13.66 ng/g near the Alamo River (Table 3.4-5). Organochlorine pesticide concentrations showed a pattern of decreasing concentration with distance from the river mouths. The highest surface sediment DDE concentrations were found at the Alamo River sites, and lowest were at the New River Far West sites. Sediment DDE levels observed at the proposed SCH sites fall within the range of values observed in the region: 4 to 48 ng/g at the SHP (saline habitat ponds) and 2 to 98 ng/g for reference habitats in the southern Salton Sea area (Miles et al. 2009).

Table 3.4-5 Estimated Sediment DDE Concentrations (ng/g) for Existing Conditions/No Action and SCH Project Alternatives

		Existing Conditions and No Action[1]		SCH Project[2]		Difference between Existing/No Action and Project	
Alternative	Pond units	Mean	Maximum	Mean	Maximum	Mean	Maximum
1	New East	6.5	23.7	7.2	28.0	0.7	4.3
	New Middle	2.8	8.0	3.5	14.7	0.7	6.7
2	New East	6.5	23.7	7.1	27.6	0.6	3.9
	New Middle	2.8	8.0	3.6	15.7	0.8	7.7
	New Far West	1.7	2.9	1.0	2.7	-0.7	- 0.2
3	New East	6.5	23.7	7.1	27.9	0.6	4.2
	New Middle	2.8	8.0	3.5	14.7	0.7	6.7
	New Far West	1.7	2.9	1.1	2.7	-0.6	- 0.2
4	Alamo Morton Bay	13.7	32.4	15.7	45.0	2.0	12.6
5	Alamo Morton Bay	13.7	32.4	19.2	66.6	5.5	34.2
	Alamo - north	13.4	34.4	12.9	34.8	- 0.5	0.4
6	Alamo Morton Bay	13.7	32.4	17.7	57.3	4.0	24.9
	Alamo - north	13.4	34.4	12.9	34.8	-0 .5	0.4

1. DDE concentrations (mean and maximum values) in undisturbed surface sediments (0 to 5 centimeters deep) measured at each location (Amrhein and Smith 2011; Wang et al. 2011)

Table 3.4-5 Estimated Sediment DDE Concentrations (ng/g) for Existing Conditions/No Action and SCH Project Alternatives

		Existing Conditions and No Action[1]		SCH Project[2]		Difference between Existing/No Action and Project	
Alternative	Pond units	Mean	Maximum	Mean	Maximum	Mean	Maximum

2. Expected (calculated) DDE concentrations for each SCH alternative, based on field measurements of surface sediments (0 to 5 centimeters) and subsurface sediments (5 to15 and 15 to 30 centimeters deep) (Wang et al. 2011), and weighted according to proportion of pond area that would remain undisturbed but inundated (surface 0- to 5-centimeter concentrations) and area disturbed by construction [borrow ditches for berms, excavated swales and channels, borrow for habitat islands) (subsurface 5- to 30-centimeter concentrations)]. "Mean" is the area weighted average calculated using mean values for surface and subsurface sediments. Because DDE concentrations below 30 centimeters are unknown and construction could disturb deeper sediments, hypothetical "maximum" concentrations were also calculated using maximum observed values of surface and subsurface sediments, as a hypothetical upper bound of potential risk.

The scientific and regulatory literature was reviewed and evaluated to determine appropriate ecotoxicological screening criteria for DDE in sediment and biota. The first tier screening criterion (31.3 ng/g DDE) is a Probable Effects Concentration (PEC) for general ecotoxicity based on sediment guidelines established by the Colorado River Basin Regional Water Quality Control Board (CRBRWQCB 2010 based on MacDonald et al. 2000) to prevent direct toxicity to the macroinvertebrate population, which serves as a food base for fish and insectivorous birds. The second tier screening criteria address potential risk of DDE bioaccumulation in birds and their eggs. These sediment bioaccumulation Screening Level Values (SLVs) are 0.55 ng/g for protection of adult fish-eating birds (herons) and 0.17 ng/g for protection against eggshell thinning in raptors (osprey) (Poulsen and Peterson 2006). A comparison of the SLV criteria to the values in Table 3.4-5 shows that existing sediment concentrations of DDE are already at levels that pose a risk for bioaccumulation that could cause adult toxicity or eggshell thinning as a result of the long-term legacy of agricultural runoff.

Finally, DDE concentrations in black-necked stilt eggs at the Salton Sea have been measured (Miles et al. 2009). These researchers cited 4.0 µg/g wet weight (ww) (Henny and Herron 1989, as cited by Miles et al. 2009) as a threshold for observed eggshell thinning in aquatic birds, and 1.7 µg/g ww (Henny et al. 2008, as cited by Miles et al. 2009) as a level at which eggshell thinning in stilt eggs was not observed at the SHP. The proportion of stilt eggs that exceeded the 1.7 µg/g p,p'-DDE value was 44 percent at the SHP, 29 percent at Freshwater Marsh/Morton Bay, and 21 percent at D-Pond/Hazard. By contrast, only 18 percent of the SHP eggs, 3 percent of the Freshwater Marsh/Morton Bay eggs, and 7 percent of the D-Pond/Hazard eggs exceeded 4.0 µg/g. Although stilt eggs are not necessarily reflective of the entire avian community, these observations give some indication that, in spite of elevated DDE levels in Salton Sea sediments, DDE concentrations in bird eggs do not pose a high potential for eggshell thinning.

Total DDT (includes dichlorodiphenyldichloroethane [DDD] and DDE) concentrations in fish tissue were measured around the Salton Sea by the State Water Resources Control Board Toxic Substances Monitoring Program (1978-1995) for use in developing sedimentation/siltation Total Maximum Daily Load guidance for New and Alamo rivers (CRBRWQCB 2002a and 2002b) and IID drains that empty directly into the Salton Sea (CRBRWQCB 2005). Mean total DDT fish tissue concentrations were 2,816 micrograms per kilogram (µg/kg) ww in the Alamo River (27 samples, representing 137 individual fish) (CRBRWQCB 2002a); 1,090 µg/kg in the New River (34 samples, representing 176 individual fish) (CRBRWQCB 2002b); and 97 µg/kg ww for Salton Sea fish (21 samples, representing 102 individual fish) (CRBRWQCB 2005). Poulsen and Peterson (2006) developed acceptable fish tissue levels of DDT,

DDD, and DDE for protection of adult bird populations (150 µg/kg ww) and for protection against eggshell thinning in raptor populations (41 µg/kg ww). Therefore, fish tissue concentrations measured in the Salton Sea and the New and Alamo rivers are already at levels that have the potential for avian toxicity and eggshell thinning.

Under the No Action Alternative, DDE concentrations would remain and slowly decrease over time due to chemical and biological breakdown of this pesticide. Bifenthrin and other current use pesticides would continue to enter the Salton Sea via the agricultural drains and rivers. Effects of these chemicals on aquatic biota and the food web at the Salton Sea are unknown.

3.4.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact BIO-1a: Project construction and operation would affect habitat and individuals of desert pupfish and several special-status bird species (significant impact).

Desert Pupfish

Because desert pupfish are or could be present in agricultural drains and in shallow water along the Sea's shoreline, construction activities for the ponds and diversion of the drain outflows around the Project area would result in habitat loss, alteration of adjacent habitat through turbidity, and mortality of some individuals. If construction activities occurred during the desert pupfish breeding season (approximately April through October), reproductive success for those mature pupfish in the Project footprint could be greatly reduced. Since the species generally does not live more than 2 years, loss of reproduction for 1 year could have substantial effects on the population size at a specific location. Construction of the pump stations and pipeline for bringing saline water from the Salton Sea to mix with the river water for salinity control in the ponds would be from a barge and the adjacent berm and would temporarily affect a small area of the Sea, primarily through underwater sound and turbidity. Few, if any, desert pupfish would be affected by this construction activity. As the Sea recedes, the outer pump station would need to be moved, or another one built, and the pipeline extension placed on or within the exposed Seabed. By that time, salinity in the Sea would exceed the tolerance of desert pupfish, and construction would not affect them.

The Project would result in a permanent isolation of existing shallow shoreline habitat (approximately 6.3 miles) where the ponds are constructed compared to current conditions. Pupfish, however, would still be able to move around (outside) the ponds via the Sea until salinity exceeds their tolerance in about 2020. Although the SCH ponds are not specifically designed or intended to provide pupfish habitat, the shallow water within them would be suitable habitat, and some pupfish are likely to be trapped in the ponds during construction if the downslope (offshore) berms are installed "in the wet" rather than on the exposed playa. These pupfish would likely persist due to the proposed water quality for the ponds but would be isolated (physically and genetically) from those in the Salton Sea and its connected waters. Isolation of populations in the drains and tributaries also would occur in approximately 2020, making the Project isolation temporary compared to future conditions (No Action Alternative). Additional pupfish may be introduced into the ponds once they are completed, particularly prior to that time when the Sea becomes too saline for them to survive in the Sea, which would increase the genetic pool in the ponds. The ponds would overflow directly into the Sea, and pupfish could enter that overflow. When the Sea's salinity or water quality exceeds their tolerance, any desert pupfish entering the overflow would be killed.

Water from existing agricultural drains that discharge to the Sea where the ponds would be built would be diverted around the ponds by new interception ditches to the east and west. Habitat used by pupfish in those drains would remain, but the individual drain connections to the Sea would be combined into two connections, thereby resulting in a greater distance for desert pupfish to traverse in the Sea between the new (combined) drain outlets. Construction of the new drain interception ditches would disturb existing pupfish habitat at the mouth of the drains and could disrupt spawning, depending on time of year, or

result in injury or mortality of individuals. The new drain interception ditches, once completed, would provide habitat for desert pupfish, but maintenance of these channels would cause periodic disturbance within that habitat and could result in disturbance to spawning or mortality of some individuals. Compared to the No Action Alternative, the Project would result in a temporary loss of shallow shoreline habitat (approximately same amount as current conditions), but as the Sea recedes, that shallow habitat would move seaward beyond the ponds and become available again until salinity exceeds the tolerance level for desert pupfish in about 2020.

Operation of the pump stations to bring saline Water to the ponds has the potential to entrain desert pupfish until the Sea becomes too saline for their survival. The intake would be screened until that time, and maintenance activities to clean or to replace the screen could affect pupfish in the intake's immediate vicinity. Maintenance of the pump stations could result in release of lubricants or other chemicals potentially toxic to pupfish. Due to the proposed location of the pump stations (adjacent to the outer berm and offshore from the ponds), few desert pupfish are likely to be affected by maintenance activities.

Maintenance activities for the ponds also could affect desert pupfish that are present in the ponds. Turbidity effects, disturbance of feeding and spawning areas, and direct mortality could occur. Dropping the water level of one or more ponds for maintenance could strand desert pupfish resulting in mortality from desiccation or predation by birds. Under an emergency situation, draining one or more of the ponds for maintenance could occur and would strand desert pupfish resulting in mortality from desiccation or predation by birds.

Overall, Alternative 1 would have significant impacts on desert pupfish when compared to both the existing environmental setting and the No Action Alternative.

Bird Species

Construction as well as operation and maintenance activities could affect special-status bird species that are present within the Project footprint through direct habitat disturbance, noise, and human presence. Individuals immediately adjacent to Project activities could also be affected by noise. Noise has been documented to adversely affect avian reproduction, and thus, construction noise and activity, if adjacent to areas occupied by nesting birds, could result in nesting failure if such activities occur during the breeding season.

Burrowing Owl. Because the burrowing owl is or could be present along the drains and berms, construction of the interception ditches and the gravity diversion pipeline and sedimentation basin could result in burrow loss and mortality of some individuals. If construction activities occurred during the burrowing owl breeding season (February through August), burrowing owl adults, eggs, or young could be trapped or killed by grading or excavation activities. Construction noise and activity, if adjacent to areas occupied by nesting burrowing owls, could result in nesting failure. If construction activities occurred during the burrowing owl wintering season and burrowing owls occupied a burrow within the construction area, the adults may be trapped, injured, or killed. Once construction was completed, burrowing owls could reestablish use of the area disturbed. No permanent loss of habitat would occur. Construction effects would be the same under both the existing environmental setting and the No Action Alternative.

Maintenance of Project roads, pond berms, and sedimentation basins could temporarily affect burrowing owl nesting or wintering as described for construction.

Overall, Alternative 1 could have significant impacts on burrowing owls when compared to both the existing environmental setting and the No Action Alternative.

California Black Rail and Yuma Clapper Rail. Because California black rail and Yuma clapper rail are or could be present within freshwater marsh habitat along the drains or within freshwater marsh habitat immediately adjacent to the Project footprint, Project construction activities could result in habitat loss, injury or mortality of individuals, or disruption of breeding. The Project could result in a loss or disturbance of suitable freshwater marsh habitat if it is present within the drain mouths that would be diverted around the Project area. Construction noise and activity, if adjacent to areas occupied by California black rail or Yuma clapper rail, such as within Bruchard Bay, Trifolium 1, or other marshes in Unit 1, could result in nesting failure if such activities occur during the breeding season (March through August). Due to the low population size of these species, any loss of individuals or their annual reproduction could adversely affect the population size.

Operation of the interception ditches, particularly in NWR Unit 1 (southwest of the New River), could reduce the amount of water in adjacent marshes such as Bruchard Bay through interception of subsurface flow. Loss or alteration of marsh habitat could affect California black rail or Yuma clapper rail breeding. Maintenance of the drain interception ditches would have the potential to affect breeding of these species if marsh vegetation develops in the channels, is colonized by either species, and is cleared during the nesting season.

Overall, Alternative 1 could have significant impacts on California black rail and Yuma clapper rail when compared to the existing environmental setting and the No Action Alternative, primarily from maintenance of the drain interception ditches, if colonized.

Other Nesting Marsh Bird Species. Redhead, least bittern, and yellow-headed blackbird are or could be present in freshwater marsh habitat as breeding birds within the Project area if freshwater marsh habitat is present within the drains that would be affected. Construction noise and activity could result in habitat disturbance or loss as well as nesting failure during the breeding season (April through August). Because these species would not be present in the Salton Sea, impacts under the existing environmental setting and the No Action Alternative would be the same. Any loss of nesting birds would be considered a significant impact.

Operation of the interception ditches could affect adjacent marsh nesting habitat as described for the black rail and Yuma clapper rail. Maintenance of the drain interception ditches would have the potential to affect breeding of these species if marsh vegetation develops in the channels, is colonized by these species, and is cleared during the nesting season.

Overall, Alternative 1 could have significant impacts on redhead, least bittern, and yellow-headed blackbird when compared to the existing environmental setting and the No Action Alternative.

Western Snowy Plover. Because western snowy plovers are or could be present nesting and wintering along the shoreline and foraging in shallow water along the Sea's shoreline, construction activities for the ponds and drain interception ditches around the Project area could result in habitat loss and mortality of some individuals. Pond construction (primarily berm on the landward side of the ponds) would cause a small loss of foraging habitat for the western snowy plover, but other foraging habitat would remain outside the Project footprint. If construction activities were to occur during their breeding season (March through August), reproductive success for those snowy plovers in the Project footprint could be greatly reduced through the destruction of nests and nest abandonment by adults due to noise and human activity. Due to the relatively small population in the region, loss of reproduction for a portion of the breeding population at the Salton Sea for up to 2 years could have substantial effects on the population size.

The Project would result in a permanent disturbance or loss of shallow shoreline habitat (approximately 6.3 miles) where the ponds are constructed compared to current conditions. The loss could also include

flooding of currently exposed shorelines along the bay on the eastern side of the New River. Western snowy plovers would still be able to move around (outside) the ponds and nest and forage along the Sea's other shoreline areas. Although the SCH ponds are not specifically built for western snowy plovers, the shallow water and shoreline within them could provide suitable foraging habitat upon completion of construction. Suitable nesting habitat and foraging opportunities may also be present where not covered by shoreline protection (e.g., riprap). However, the low berm (approximately 2 feet high) with its associated road along the landward side of the ponds could eliminate or alter shoreline habitat used by western snowy plovers for resting and nesting. Compared to the No Action Alternative, the Project would result in a temporary loss of shoreline habitat (approximately same amount as current conditions) until the Sea recedes beyond the SCH ponds.

Maintenance activities along the shoreline of the ponds may result in impacts on western snowy plover nesting, if maintenance takes place during the breeding season and if the species nests within the Project area.

Overall, Alternative 1 would have significant impacts on snowy plover when compared to the existing environmental setting and the No Action Alternative.

Riparian Bird Species. Because white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher are or could be present in riparian habitat along the New River within the SCH pond area or upstream along the conveyance pipeline route, construction activities for the river diversion and conveyance pipelines as well as the berm improvement and road construction along both sides of the river between the ponds could result in riparian habitat loss or disturbance that could cause failure of nesting and possible mortality of some individuals. While loss of habitat is anticipated to be minimal, noise and human activity immediately adjacent to the riparian corridor could adversely affect breeding for any individuals present in that area if construction activities occur during the riparian bird breeding season (April through September). Impacts would be the same compared to the No Action Alternative and existing conditions.

Maintenance activities could result in a minor amount of riparian habitat loss or disturbance at the diversion location and where the river and Sea water pipelines enter the ponds. During the breeding season, maintenance activities could result in nesting failure and possible mortality of a few individuals, primarily nestlings. Maintenance of and driving along the river berms during the nesting season could have similar impacts. This impact is anticipated to be minimal and could be avoided by timing maintenance activities at those locations for outside the breeding season.

Overall, Alternative 1 could have significant impacts on riparian bird species, including white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher when compared to the existing environmental setting and the No Action Alternative.

Gull-Billed Tern and Black Skimmer. The gull-billed tern and black skimmer both occur at the Salton Sea for breeding and foraging, and both prefer to nest on islands for protection from predators as they are ground-nesting species. No island nesting sites are currently present within the Project area for Alternative 1; however, both species have occasionally nested along the Sea's shoreline, although with limited success. Although it is unlikely that construction would result in direct impacts on the gull-billed tern and black skimmer, nesting failure due to construction activities or noise adjacent to nesting areas could occur if construction activities, including drain interception ditch construction, took place during the species' breeding season (April through September). Since relatively few individuals are present in the region, loss of reproduction for even a portion of the local breeding population for 1 year could have substantial effects on the population size. Construction of the river diversion, sedimentation basins, and conveyance pipelines would not affect any breeding habitat.

Project construction would result in a temporary disturbance or alteration of shallow shoreline habitat (approximately 6.3 miles) where the ponds would be constructed compared to current conditions. Although gull-billed terns and black skimmers might forage along the shoreline, few would be expected in this area because nesting is limited due to lack of predator protection along the shoreline. Construction noise and activity, if adjacent to areas occupied by gull-billed tern or black skimmer, would have a low potential to result in nesting failure if such activities occur during the breeding season (April through September).

Maintenance activities within the ponds would have the potential to affect nesting birds through noise and human presence, if such activities occurred during the breeding season and near nesting sites.

Overall, Alternative 1 would have beneficial impacts (See Impact BIO-1c) due to increased nesting opportunities; however, it also could result in significant impacts of noise and human activity on the gull-billed tern and black skimmer when compared to the existing environmental setting and the No Action Alternative during construction, operation, and maintenance.

Loggerhead Shrike. Because loggerhead shrikes are or could be present in shrub and scrub habitat along the Salton Sea shoreline, Project construction activities for the drain interception ditches and the landward pond berm could result in temporary disturbance of suitable habitat. Suitable habitat could also be present along the water delivery pipeline corridor and be disturbed or lost during installation of the pipelines. If these construction activities would result in habitat disturbance or loss during the breeding season (April through September), breeding efforts of any pairs present may fail. Construction noise and activity, if adjacent to areas occupied by nesting loggerhead shrikes, could result in nesting failure. Compared to the No Action Alternative and current existing conditions, the Project could result in impacts on nesting loggerhead shrike if nesting habitat is present within or immediately adjacent to the construction area. Maintenance of the drain interception ditches could affect breeding loggerhead shrikes immediately adjacent to the channels if maintenance occurred during the breeding season.

Overall, Alternative 1 could have significant impacts on loggerhead shrikes when compared to the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM BIO-1: Prepare and implement a desert pupfish protection and relocation plan. This plan is applies primarily to construction and maintenance of the drain interception ditches but will also apply to pond construction and maintenance activities as noted and will provide:

1. Protocols for preconstruction or premaintenance surveys to assess species presence and spawning within or immediately adjacent to work areas (e.g., in the drains/drain channels, along the shoreline if construction is in the “wet,” and around the pond margins for maintenance);

2. Capture (e.g., trapping in the drains for construction and maintenance; or trapping, dip netting, and seining in the ponds if drained or if the water level is dropped) and transport methods to minimize handling and stress as well as exposure to heat, low DO, and crowding;

3. Identification of locations for release of captured desert pupfish;

4. Timing windows when construction or maintenance in shallow shoreline areas and in the drain mouths/channels may be conducted with minimal effects on desert pupfish spawning;

5. Protocols for maintenance activities in the drain interception ditches, such as a rotating schedule to ensure only a portion of the channel is maintained at one time, clearing only part of the vegetation at one time, and timing of maintenance to avoid peak spawning;

6. Maintenance protocol for the 1/8-inch mesh screen on the saline water intake until salinity reaches 68 ppt; and

7. Adaptive management procedures that include assessment of mitigation measure effectiveness, development of revised measures to improve effectiveness, and similar assessment of revised measures to verify effectiveness.

All desert pupfish mitigation measures will be in conformance with the Biological Opinion from USFWS for the Project.

MM BIO-2: Prepare and implement a preconstruction/maintenance survey plan for bird species. The plan will include preparation of suitable habitat maps that are updated periodically to focus survey locations as well as survey methods consistent with current science and regulations. Adaptive management measures will also be included in the plan. The following describes the surveys and their timing for various bird species.

Burrowing Owl. To avoid impacts on nesting or wintering burrowing owls within the Project impact area, conduct preconstruction (or pre-maintenance) surveys within suitable burrowing owl habitat that could be affected by Project activities. Surveys will be conducted using the latest protocol methods and with concurrence from DFG; currently, methods described by the Department of Fish and Game Staff Report on Burrowing Owl Mitigation (DFG 1995) will be used. If burrowing owls are detected nesting or wintering within the Project impact area, a buffer will be established around the active burrow so that direct impacts on the burrow will be avoided. For construction during the breeding season (February through August), a buffer of 250 feet around the active nesting burrow will be maintained until breeding is complete and the young have fledged (can fly). For nonbreeding birds, the buffer will be 160 feet. If burrowing owls are detected occupying a burrow within the Project impact area at any time of year, the owls will be removed using passive methods during the nonbreeding season. Passive removal involves excluding owls from their occupied burrows and creating alternate natural or artificial burrows for them that are at least 160 feet from the impact area and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair (DFG 1995). Passive relocation may be implemented during the breeding season if a qualified biologist can verify through noninvasive methods, such as scoping, that breeding has not begun or juveniles are foraging independently and able to fly. The unoccupied burrows would be collapsed in accordance with DFG-approved guidelines (DFG 1995).

California Black Rail and Yuma Clapper Rail. Conduct preconstruction (or premaintenance) focused surveys for California black rail and Yuma clapper rail where Project features are within or immediately adjacent to suitable habitat. Surveys will be conducted using current USFWS methods and/or methods approved by the DFG. If California black rails or Yuma clapper rails are detected within 500 feet of planned construction/maintenance activity locations, work within that distance of the birds will be rescheduled for after the birds complete nesting.

Nesting Birds. Conduct preconstruction (or premaintenance) surveys for all Project features within suitable habitat if construction or maintenance activities will take place during the breeding season. Breeding birds are protected under the Migratory Treaty Bird Act as described in Impact BIO-5a. Surveys will be conducted using methods approved by the DFG. If breeding birds are detected within the Project impact area, a protective buffer (100 to 500 feet, depending on species) will be provided until it is confirmed that breeding is complete.

Western Snowy Plover. Conduct preconstruction (or pre-maintenance) focused surveys for western snowy plovers within suitable habitat that could be affected. Surveys will be conducted using current USFWS methods and/or methods approved by the DFG. If western snowy plovers are detected within the Project impact area, construction or maintenance activities will be conducted under a qualified biologist's supervision so that direct impacts are avoided. If breeding snowy plovers are detected within the Project impact area, construction or maintenance will be postponed and a protective buffer provided until it is confirmed that breeding is complete.

MM BIO-3: Conduct noise calculations/measurements and implement noise attenuation measures, if needed. Based on equipment specifications, calculate or measure the distance from equipment where noise would be greater than or equal to 60 A-weighted decibels (dBA) equivalent sound level (Leq). This would also include multiple noise sources, if applicable. Then, use that distance to determine where noise could exceed 60 dBA Leq within known or potential nesting habitat adjacent to the Project footprint. If any such overlaps occur, schedule work to avoid the breeding season in those areas. If construction must occur during the breeding season at those sites, monitor nesting activity to determine if any effects are occurring. If effects are observed, implement noise attenuation measures such as noise walls and hay bales. Monitor the noise and bird behavior to verify that attenuation measures are successful. Develop and implement additional protection measures if monitoring shows that impacts are still occurring. If noise would be less than 60 dBA Leq, no additional measures are required. (Note: The threshold of 60 dBA Leq used here to protect bird nesting is a conservative estimate of the level above which adverse effects could occur. The actual threshold varies by species and type of noise.)

MM BIO-4: Design interception ditches to avoid alteration of water levels in adjacent marshes. Design of the interception ditches will balance local surface and subsurface water movement so that the amount of water in adjacent marshes is not affected.

Residual Impact

Implementation of MM BIO-1 would reduce impacts on desert pupfish to less than significant because many individuals in the drains would be moved to safe areas and disruption of spawning would be minimized.

Implementation of MM BIO-2 and MM BIO-3 would reduce impacts on burrowing owls, California black rails, Yuma clapper rails, other nesting marsh and riparian birds, western snowy plovers, nesting gull-billed terns and black skimmers, and nesting loggerhead shrikes to less than significant because impacts on nesting and wintering individuals would be avoided.

Implementation of MM BIO-4 would avoid impacts on adjacent marsh habitat for nesting birds.

Impact BIO-1b: Project construction and operation would have minor effects on habitat and individuals of several special-status bird and mammal species (less-than-significant or no impact).

Fish

Mosquito control activities, in accordance with the Mosquito Control Plan (Appendix F), would have minimal effects on desert pupfish. Bacterial larvicides that could be used are not toxic to fish and would have minimal effects on invertebrate prey. Use of adulticides would not occur over the SCH ponds, thus minimizing the potential for toxic effects on pupfish. Impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Birds

During operations, noise from the pumps that brings saline water to the ponds is unlikely to affect breeding because the pump stations would be located at the edge of the outer berm and offshore (approximately 3,000 feet or more from the existing shoreline), or on the exposed seabed when the Sea recedes that far.

Burrowing Owl. Construction of the pump stations and pipeline for bringing saline water from the Salton Sea to mix with the water for salinity control in the ponds would be unlikely to affect burrowing owls unless they had nesting or wintering burrows within the small area where the pipeline would cross the river bank. As the Salton Sea recedes, the outer pump station may require relocation or reconstruction and a pipeline extension placed on or within the exposed Seabed. These activities would not affect burrowing owls because none are expected to be present in the recently exposed Seabed due to lack of suitable habitat. No impacts would occur compared to the existing environmental setting and the No Action Alternative.

California Black Rail and Yuma Clapper Rail. Operation and maintenance of the pump stations to bring saline water to the ponds would not affect breeding of the California black rail and Yuma clapper rail because no suitable habitat for these species is present at or near those locations. Maintenance of the ponds would not affect these species because salinity of the habitat pond water and design of the sedimentation basins (steep slopes, water depth greater than emergent vegetation can grow in) would prevent development of marsh habitat used by these species. Noise from maintenance activities within the ponds would not be high enough to affect either species in nearby habitats due to attenuation with distance. The sedimentation basins are designed to minimize growth of emergent vegetation with maintenance at least annually so that no habitat suitable for either rail species would develop. Impacts on both species would be less than significant compared to the existing environmental setting and the No Action Alternative.

Other Nesting Marsh Bird Species. Operation and maintenance of the pump stations to bring saline water to the ponds would not disrupt breeding of the redhead, least bittern, or yellow-headed blackbird because no suitable habitat for these species is present at or near those locations. As described for the rail species, the Project ponds and sedimentation basins would not provide suitable habitat for marsh bird nesting. Impacts would be less than significant compared to the existing environmental setting and the No Action Alternative.

Western Snowy Plover. Operation of the pump stations to bring saline water to the ponds would not disrupt breeding of the western snowy plover because no suitable nesting habitat for the species is present at the location of the pump stations. No impacts would occur compared to the existing environmental setting and the No Action Alternative.

Riparian Bird Species. Operation of the pump stations to bring saline water to the ponds would not disrupt breeding of the riparian bird species because no suitable nesting habitat for these species is present at the pump stations' locations. No impacts would occur compared to the existing environmental setting and the No Action Alternative.

Gull-Billed Tern and Black Skimmer. Compared to the No Action Alternative, Project construction would result in temporary disturbance or alteration of shallow shoreline habitat, but would maintain that shoreline as the Sea recedes, presumably providing a continuing food source within the ponds that would not otherwise exist under the No Action Alternative. Compared to current conditions, the Project would result in a temporary loss of foraging area and a very limited loss of potential nesting areas, and would equally replace foraging areas. Impacts would be less than significant compared to the existing environmental setting and the No Action Alternative.

Loggerhead Shrike. Operation and maintenance activities for the ponds and pump stations are not expected to affect loggerhead shrike breeding because these activities would not occur in or adjacent to nesting habitat. No impacts would occur compared to the existing environmental setting and the No Action Alternative.

Mountain Plover, Lesser Sandhill Crane, and Greater Sandhill Crane. The mountain plover and lesser and greater sandhill cranes occur near the Project area as wintering species. They occur within plowed, barren, and burned agricultural fields and could occur within the Project area depending on placement of the diversion and conveyance pipeline. The mountain plover and lesser and greater sandhill cranes are nomadic and forage where suitable food is available. Their occurrence within the region and within the Project area is unpredictable. Due to their nomadic nature and flexibility for foraging, the foraging large area that is available to them, and their ability to avoid disburbances, these species are unlikely to be affected by Project construction and operation (including maintenance). Therefore, impacts would be less than significant. Assuming suitable foraging habitat would be available, Project effects on these species would be similar under the No Action Alternative and existing conditions.

American Peregrine Falcon and Bald Eagle. The American peregrine falcon and bald eagle occur within the Project area as wintering species but may also occur as visitors at any time of year. They forage over open water as well as over agricultural fields and could occur within the Project area. These species are nomadic in their behavior and forage opportunistically wherever suitable food is available. Their occurrence within the region and within the Project area is unpredictable. Due to the nomadic nature of their occurrence and flexibility for foraging, and the large area that is available to them for foraging, it is unlikely that these species would be affected by Project construction, operation, or maintenance, and impacts would be less than significant. A similar amount of foraging habitat would be available for these species under the No Action Alternative and as compared to current existing conditions.

Wood Stork. The wood stork occurs within the Project region as a nonbreeding species, and forages along the shoreline and in the bays at the New and Alamo rivers and also within flooded fields; it could occur within the Project area. The species will forage wherever suitable food is available. Due to the nomadic nature of their occurrence and flexibility for foraging, and the large area that is available to them for foraging, it is unlikely that the species would be affected by Project construction, operation, or maintenance, and impacts would be less than significant. The amount of foraging habitat for the species would be similar under the No Action Alternative and current existing conditions.

Large-Billed Savannah Sparrow. The large-billed savannah sparrow occurs within the Project region as a wintering species. The species is loosely territorial or occurs in flocks during the period when present at the Salton Sea and will forage wherever suitable food is available, including in shrubs and on the beach along the shoreline but also around existing upland ponds and along weedy ditches. It has the potential to be present in the drain interception ditch areas and along the diversion pipeline route. Due to the nomadic nature of their occurrence and flexibility for foraging, and the large area that is available to them for foraging, it is unlikely that the species would be affected by Project construction, operation, or maintenance, and impacts would be less than significant. The amount of foraging habitat for the species would be similar under the No Action Alternative and current existing conditions.

Mammals

Western Yellow Bat. The western yellow bat has a moderate potential to occur within the Project area and could forage over the entire Project region. The potential for roosting in trees along the New River is low as the species prefers palm trees that are not present there. The species forages opportunistically wherever suitable food is available. Due to the unpredictable and opportunistic nature of their occurrence, flexibility for foraging habitat and location, the large area that is available to them for foraging, and the small amount of foraging habitat within the Project area, it is unlikely that the species would be affected

by the Project construction, operation, or maintenance, a less-than-significant impact when compared to the existing environmental setting and the No Action Alternative.

American Badger. Because the American badger has a low potential to occur within the Project area but was recorded in the region in the past and could forage within much of the riparian habitat along the New River as well as in scrub habitats, construction activities for the diversion and conveyance pipelines could result in habitat disturbance and affect individuals if construction collapsed or destroyed a badger burrow. Due to the unpredictable and opportunistic nature of their occurrence, flexibility for foraging habitat and location, and the large area that is available to them for foraging, it is unlikely that the species would be affected by Project construction and operation, a less-than-significant impact. A similar amount of foraging habitat could be affected under the No Action Alternative and the existing conditions.

Impact BIO-1c: Project operation would provide habitat for desert pupfish and several special-status bird species (beneficial impact). The SCH ponds would provide additional habitat for desert pupfish after the Salton Sea exceeds their water quality tolerances. Isolated populations would remain where the drains and tributaries (rivers and several streams) enter the Sea, but the ponds would provide approximately 3,130 acres of habitat with suitable water quality. In addition, the population in the drains entering the interception ditches would be permanently connected.

The SCH ponds are specifically designed to attract gull-billed tern and black skimmer, among several other special-status bird species, and the habitat provided would include the shallow water they require for foraging, a food source, and constructed islands that would provide predator protection for nesting upon completion of construction, which would increase the amount of habitat for these species. The addition of islands protected from predators and a food source for piscivorous birds is a beneficial impact of the Project.

Increasing salinity in the Sea may result in changes to the invertebrate food base for the species during the Project. Whether western snowy plovers would be affected by these changes is not known at this time. If, under the No Action Alternative conditions, the increased salinity changes the prey base and the food source is unsuitable for the western snowy plover, the Project would have a beneficial impact on this species by providing foraging opportunities that may not exist under the No Action Alternative.

Impact BIO-2: Project construction and operation would cause a temporary disturbance or loss of riparian habitat and/or sensitive habitat (significant impact). Project construction activities could result in removal of riparian habitat, particularly stands of tamarisk adjacent to the New River, depending on the amount of excavation for material to construct the ponds and berms. For areas to be inundated by the ponds or where structures would be placed (e.g., access roadways along the river berms, river water intake), the loss would be permanent. Riparian habitat would be disturbed or temporarily removed for construction of the water delivery pipelines and berms separating the river from the ponds. A small amount of mesquite bosque is anticipated to be avoided but could also be affected by construction of the diversion structure and sedimentation basin, depending on their exact location. However, these Project structures would be placed to minimize or avoid impacts to the maximum extent feasible. In addition, habitat removed by the Project would be restored to its original condition, or more desirable habitat, following construction of the conveyance pipelines. For example, it would be acceptable to replace tamarisk scrub that was removed with screwbean mesquite bosque.

If removal of riparian habitat were substantial (greater than 2 acres) or if screwbean mesquite bosque were removed, this impact would be significant. As currently planned, mesquite bosque would not be removed, approximately 7 acres of tamarisk would be temporarily removed for construction of the diversion along the New River, and approximately 87 acres of tamarisk scrub and woodland could be removed for construction of the ponds. Removal of up to 87 acres of tamarisk for pond construction

represents the worst case and actual numbers would probably be lower depending on exact limits of excavation for material to construct the berms.

Removal of riparian and/or sensitive habitat would be a significant impact when compared to the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM BIO-5: Prepare and implement a Habitat Protection, Mitigation, and Restoration Program. Plan preparation will be complete prior to commencement of construction. The restoration program will address the following considerations:

1. Avoidance of sensitive and riparian habitats to the greatest extent feasible, including avoidance of disturbances in or near these habitats during the bird breeding season.
2. Quantifying maximum area of naturally occurring plant communities that could be temporarily and permanently removed for construction of Project facilities, by plant community.
3. Restoration at a minimum rate of 1:1 for nonnative plant communities (i.e., tamarisk woodland or scrub) and 3:1 for native plant communities temporarily removed during Project construction, or as required in Project permits. Habitats restored at 1:1 will be preferentially restored where they were removed, unless it is infeasible or a more desirable off-site location is identified. Species to be used in restoration may include either those that were removed or native species that occur or occurred naturally in the Project area and are suitable to the site. If native species are used to replace nonnative species, mitigation ratios can be reduced. For restoration of tamarisk temporarily removed, natural colonization of the disturbed area is likely to occur and no planting may be needed. The area would still be monitored to document restoration. Permanently removed riparian habitat within the pond area would be replaced by aquatic habitat of equal surface area with a similar or greater ecological value.
4. Identification of locations for on- and off-site restoration, including funding for land purchases and/or easements and agreements with property owners to complete the restoration.
5. Use of only local native seed (or propagule) sources for native species used in restoration.
6. Details on propagation, planting/seeding, irrigation, maintenance (including weed control for species that could interfere with restoration), site access, remedial measures, monitoring, reporting, and photo-documentation. These details will be specific to each site if more than one planting area or type is addressed in the plan.
7. Performance criteria to be met for each habitat type being restored.
8. Monitoring, with a funding source, until performance criteria are met, which may be for a minimum of 5 years.

Residual Impact

The residual impact would be less than significant following implementation of MM BIO-5, because habitat that would be removed would be restored in at least the amount that was removed.

Impact BIO-3a: Project construction would result in temporary disturbance of Federal Waters of the U.S. and minimal effects on wetlands (less-than-significant impact). When compared to existing conditions, construction of the ponds and diversion would result in a temporary disturbance to approximately 1,335 acres of Waters of the U.S. because the ponds would be built within the existing Salton Sea and the diversion would be on the bank of the New River. Although placement of permanent Project facilities in Waters of the U.S., including the berms and pump stations for the ponds, would result

in a permanent loss of approximately 22 acres of Waters of the U.S., the Project would have a net increase of 1,775 acres (see Impact BIO-3b).

Compared to the No Action Alternative, construction activities would result in temporary disturbance to a smaller amount of Waters of the U.S. than under current conditions because the Sea would have receded some by the time construction begins and will continue to recede even more before construction is completed. The berms and pump stations for the ponds would be permanent facilities, but their impact would be temporary as the Sea recedes. Construction of the diversion would cause the same temporary disturbance of Waters of the U.S. as described for the existing conditions. Under the No Action Alternative, construction impacts on Waters of the U.S. would be less than significant because the disturbance would be temporary as would the small loss as a result of berms. Operation and maintenance of the ponds and associated facilities would cause temporary disturbances to Waters of the U.S. at intervals during the Project life. Overall, impacts would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Construction activities could result in the minimal removal of wetlands, primarily during construction of the river diversion and drain interception ditches. The steep earthen sides of the sedimentation basin would grow a narrow band of emergent wetland vegetation that would likely be removed at least annually during basin maintenance. Removal of the small amounts of wetlands that develop in the sedimentation basin would be a less-than-significant impact when compared to the existing environmental setting and the No Action Alternative.

Operation of the interception ditches would have the potential to affect adjacent wetlands by reducing the amount of water in them as described in Impact BIO-1a. No substantial loss of wetlands is likely to occur, but less-than-significant alteration of some wetlands could occur. Implementation of MM BIO-4 would avoid this impact.

Impact BIO-3b: Project operation would increase the amount of Federal Waters of the U.S. (beneficial impact). Compared to existing conditions, Alternative 1 would result in a net increase in the extent of Waters of the U.S. by about 1,775 acres because the ponds would restore Waters of the U.S. between elevation -228 feet and -231 feet previously lost by the receding Sea. With the Sea's anticipated receding shoreline under the No Action Alternative, the amount of Waters of the U.S. restored would be increasingly more (up to the entire pond area minus berms and islands). The Project is anticipated to also improve the quality of Waters of the U.S. within the area occupied by the SCH ponds compared to the existing environmental setting and the No Action Alternative, and overall impacts would be beneficial.

Impact BIO-4: Project construction and operation would not interfere with movement of fish and wildlife species, but construction could remove snags for colonial nesting birds (less-than-significant impact). Effects of Alternative 1 on desert pupfish movement have been addressed in Impact BIO-1a. Movement of other aquatic species would not be affected by Project construction and operation. No migratory fish are present, and construction of the ponds and diversion structure would not interfere with movement of the nonnative aquatic species in the Salton Sea and New River. Impacts on aquatic species movement would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Construction activities could result in the direct removal of snags that are used by colonial nesting birds that include double-crested cormorant, great blue heron, cattle egret, great egret, and snowy egret. However, most snags could be avoided and left in place for use by birds until they deteriorate and collapse due to natural processes. A few trees located adjacent to the New River that may be used by colonial nesters also could be removed, depending on placement of the diversion structure and conveyance pipeline crossing of the New River to reach the eastern ponds as well as improvement of the

river berms. However, the Project structures would be placed to minimize or avoid impacts to the maximum extent feasible. Removal of snags and nest trees during construction would be a less-than-significant impact compared to existing conditions. Compared to the No Action Alternative conditions, the snags would be lost as the Sea recedes, but nesting tree loss would have the same short-term impact as under existing conditions. Implementation of MM BIO-5 would further reduce impacts on colonial nesting birds.

Impact BIO-5a: Project construction and operation could affect nesting by some common bird species and introduction of invasive species (significant impact). The Salton Sea and surrounding region provide nesting, wintering, and migration stopover habitat for hundreds of bird species and thousands of individuals. The Project area provides habitat for a subset of the species and individuals that occur within the greater Salton Sea area. A number of common bird species could be affected by the Project. (Effects on special-status birds such as burrowing owl, black skimmer, and gull-billed tern have been addressed under Impact BIO-1a.)

Because common species are or could be present nesting and/or foraging for breeding, within or immediately adjacent to the Project footprint, construction activities for the ponds, drain interception ditches around the Project area, and diversion facilities, if they were to occur during the bird breeding season (March through September), could result in destruction of nests and nest abandonment by adults due to direct disturbance or noise and human activity. Nesting birds are protected under the Migratory Bird Treaty Act and Fish and Game Code Section 3503, and impacts on nesting are considered a significant impact compared to the existing environmental setting and the No Action Alternative.

Maintenance activities have the potential to disturb bird nesting on the islands and along the berms if such activities occurred during the breeding season. Such disturbances could cause nest abandonment or nest destruction if physical activities occurred on the islands or along the berms. During operations, both pump stations would provide an isolated structure that could be used by some species of birds for resting, roosting, or even nesting. These structures may include deterrents to bird use (see Section 2.4.1.2). If such deterrents are not used or are not effective, maintenance of the pump stations would intermittently disturb any birds using the structures. Disturbance during the nesting season could result in nest failure for the pairs using the structures.

Invasive plants and animals could be brought into the Project site on construction and operations/maintenance equipment, including hand tools, as well as vehicles and boots of workers. Invasive terrestrial plants not already present are less likely to be introduced than invasive aquatic plant species. Invasive aquatic animal species are also a concern, particularly in fresh to brackish areas, where they can alter ecological functions by competing for space and food as well as harboring parasites that can affect fish productivity. Several invasive species of snails are known to be present in the Salton Basin and could be transported to the SCH site via equipment operated by local contractors as well as local workers. Invasive species from outside the region could also be brought in on equipment from other areas.

Alternative 1 could have significant impacts on common nesting birds. If invasive species become established as a result of the Project, impacts could be significant.

Mitigation Measures

For disturbance impacts on nesting birds, MM BIO-2 and MM BIO-3 would apply.

MM BIO-6: Clean equipment prior to site delivery. Specifications for ensuring that all equipment, personal gear, and materials brought to the site are clean and free of invasive plants (including seeds) and animals will be included in all construction and maintenance contracts. Equipment, gear, and other materials will be inspected to verify that it is clean.

Residual Impact

With implementation of MM BIO-2 and MM BIO-3, residual impacts would be less than significant because disturbance of nesting birds would be avoided. Implementation of MM BIO-6 would reduce residual impacts of invasive species to less than significant by minimizing the potential for introduction of such species.

Impact BIO-5b: Project construction and operation would have minor effects on common fish (native and nonnative), wildlife species, and native plant communities (less-than-significant or no impact). No common upland native plant communities are present in the Alternative 1 area, and no impacts would occur from Project construction or operation.

Some aquatic organisms would be entrained with the water diverted from the New River and end up in the sedimentation basin and ultimately in the SCH ponds. Since they are freshwater species, many would survive in the sedimentation basin, but none are expected to survive in the ponds, which would typically be managed at salinities above 20 ppt. River flow downstream of the diversion would be reduced (see Section 3.11) which would also reduce the amount (volume) of aquatic habitat. Loss of some individuals of or habitat for nonnative species would not adversely affect their populations in the New River, and impacts would be less than significant.

Although the Project generally would benefit aquatic species, some water quality instabilities are likely to occur, at least in some of the ponds, which could affect aquatic organisms. The nutrient load in the New River would sustain high primary productivity (primarily phytoplankton) to support invertebrates and fish. As a result, DO in the ponds could become very low at times, such as near dawn, due to respiration of all organisms present. Water temperatures are also expected to fluctuate in these shallow ponds on a daily and seasonal basis with thermal stratification occurring at times. The lower thermal and DO tolerances for fish may be exceeded under certain environmental conditions, but not necessarily at the same time, resulting in fish kills that reduce the population size in the ponds where this phenomenon occurs. The lower DO tolerance for some benthic invertebrate species that provide food for fish may also be exceeded at times in some locations, primarily in the deeper portions of some ponds. The duration of such events is expected to be short with rapid recovery of the fish and invertebrate populations. Impacts on aquatic species would be less than significant, but loss of adequate fish for forage could affect piscivorous birds that rely on the ponds for forage. The level of effect would depend on how extensive the fish die-off was (i.e., what proportion of fish present were killed in a pond and how many ponds were affected). The Project is designed to test various pond designs with monitoring to determine what works best to meet the Project goals and objectives.

The Project would result in a temporary disturbance or loss of shallow shoreline habitat (approximately 6.3 miles) where the ponds would be constructed compared to current conditions. Individuals of shoreline and shallow water foraging species would still be able to move around (outside) the ponds and forage along the Sea's other shoreline areas. Although the SCH ponds are not specifically designed for species that forage on invertebrates, the shallow water within them would provide the same amount or more suitable foraging habitat. The part of the existing shoreline not altered by the shoreline low berm, associated road, and slope protection would again be available for nesting and foraging upon completion of construction, and shorelines along the pond berms could provide additional habitat, although it may be rocky rather than sedimentary due to slope protection. For common piscivorous birds such as the American white pelican, Caspian tern, and double-crested cormorant, construction would temporarily preclude foraging within the work area, a less-than-significant impact. Limited nesting habitat is currently present in the Alternative 1 area due to lack of predator protection along the shoreline, and impacts on nesting habitat would be less than significant.

Project construction could result in temporary disturbances to terrestrial wildlife habitats through ground disturbance and noise. Construction of the landside berm, improvement of the river berms, and excavation of the drain interception ditches would occur in terrestrial habitats, but a small amount of habitat would be affected. Individuals of most species would move out of the disturbance area so that few individuals would be directly affected. Maintenance activities would cause temporary disturbances at specific locations for short periods of time, such as driving on access roads (including on the berms) or operation of maintenance equipment. These impacts would be less than significant compared to current conditions and the No Action Alternative.

Operation of the pump stations to bring saline water to the ponds would not disrupt breeding of common birds that nest within the Project area because the pump stations would be located adjacent to the seaward side of the outer berm and in the Sea away from any nesting habitat, including the islands within the ponds. Maintenance activities have the potential to disturb bird foraging throughout the Project. Effects on foraging, however, would be less than significant because maintenance would occur in only a portion of the ponds at a time leaving other foraging areas available nearby within the Project area.

The sedimentation basin adjacent to the river diversion would likely attract birds, such as ducks and gulls, that rest on the water surface. Due to the basin's steep sides and annual maintenance, foraging and nesting habitat for these species would not develop. The basin, therefore, would not increase the population size of these birds. Ducks and geese are present at the Salton Sea primarily during the winter when the duck clubs operate, and the amount of surface water provided by the basin (approximately 60 acres) would be small compared to that of the duck clubs. Piscivorous birds may use the basin to forage if populations of fish develop from individuals entrained with the diverted water. Impacts of operation and maintenance of the sedimentation basins on birds would be less than significant compared to the existing environmental setting and the No Action Alternative.

Effects of Contaminants

Contaminants in the water and sediment, such as selenium and pesticides, could impact biota utilizing the SCH ponds. Breeding species that could be exposed to selenium by feeding at the SCH ponds include gull-billed tern, California brown pelican, double-crested cormorant, Caspian tern, black skimmer, black-necked stilt, American avocet, and western snowy plover. Ecorisk modeling was used to estimate potential selenium concentrations in water and biota for different Project alternatives and operations (model scenarios of river water blended with Salton Sea water to achieve 20 ppt or 35 ppt salinity in ponds) (Sickman et al. 2011, see Appendix I). For Alternative 1, estimated egg selenium concentrations would be 6.0-8.3 µg/g dw in ponds operated at salinities of 20 to 35 ppt, and less than 6 µg/g dw for ponds operated at 40 ppt or greater. This egg selenium concentration exceeds the conservative toxicity threshold (>6.0 µg/g dw), which would increase the probability of reduced hatching success in some species, but would not reach levels associated with teratogenesis (>12 µg/g dw) (Ohlendorf and Heinz 2011).

The actual magnitude of selenium impacts for the SCH Project would be lower than estimated by Sickman et al. (2011). First, the ecorisk model assumed all diet comes from the SCH ponds. The actual concentrations would likely be lower than modeled because the birds' foraging range would include other habitats beyond the SCH ponds. For example, the actual concentration could be less for gull-billed terns because they forage extensively in agricultural fields as well as consuming fish. Second, when the model was run using parameters estimated from the SHP complex, the modeled egg selenium concentrations were greater than the actual measured egg concentrations (Miles et al. 2009), indicating that this ecorisk model is a very conservative estimator of risk. Third, selenium concentrations decreased over time at other constructed habitats in the region, both in sediment of freshwater treatment wetlands (Johnson et al. 2009) and eggs from saline ponds (Miles et al. 2009), which suggests that selenium removal pathways could develop within the first 1 to 2 years after construction (Sickman et al. 2011). Impacts of Alternative

1 on common bird reproductive success would be less than significant for bird species that forage on invertebrates due to the availability of other freshwater marsh foraging habitat in the area. For species of piscivorous birds that nest at the Sea, such as the Caspian tern, a reduction in breeding success would be unlikely, at least until fish are no longer present in the Sea, because foraging would not be limited to the SCH ponds and pond management to minimize the selenium risk would occur. To minimize selenium bioaccumulation through detritus, the SCH ponds and sedimentation basins would be designed and operated to discourage the growth of emergent vegetation, such as cattails and bulrushes, which contribute high amounts of organic matter. Impacts on common birds would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Concerning pesticides, the predominant pesticide residue measured in Salton Sea sediments was DDE. Existing and estimated concentrations of DDE in sediments for each of the alternatives is presented in Table 3.4-5. The area-weighted DDE concentration (SCH Project column) of inundated pond sediment (undisturbed playa surface, borrow ditches, habitat swales, and submerged edges of berms and islands) was compared to existing conditions (i.e., DDE concentration of undisturbed surface sediment) to determine whether exposure to DDE would change due to pond construction and inundation.

For Alternative 1, the estimated DDE concentration of pond sediments would be very similar to existing conditions, with an increase of 0.7 ng/g for estimates based on mean existing DDE concentrations and an increase of 4.3 to 6.7 ng/g for estimates using only the highest observed DDE concentration (Table 3.4-5). Alternative 1 did not exceed the PEC concentration of 31.3 ng/g for any estimation. Impacts of DDE exposure from the Project would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Effects of Diseases

Bird and fish die-offs have occurred since the Sea's creation in 1905, but their frequency and intensity have increased in the past 2 decades (Friend 2002; Moreau et al. 2007). Avian botulism, avian cholera, and Newcastle disease were determined to be the major causes of most monitored bird die-offs in the 1990s (DWR and DFG 2007; Moreau et al. 2007). Botulism spores occur in the sediment and are ingested by fish such as tilapia. Fish die-offs occur periodically at the Salton Sea, and fish-eating birds, especially pelicans, can die from botulism toxins ingested from dying fish. In general, outbreaks of avian cholera, a bacterial disease, occur among dense concentrations of waterfowl, usually during the winter. Most recently, outbreaks of botulism have occurred in 2006 and 2008. In the past 2 years, one episode of avian cholera began in December 2010 and ended before February 2011 (personal communication, K. Riesz 2011).

The proposed SCH ponds would have a low potential to expose birds to disease. If extensive fish die-offs occur in the ponds due to conditions such as anoxia or temperature extremes, the dead fish could poison fish-eating birds. The conditions that result in fish die-offs in the Salton Sea are usually due to large turnover events where deep anoxic waters come to the surface. In contrast, the SCH ponds would be much shallower and experience more mixing, which is expected to result in lower biological oxygen demand and less severe conditions of anoxia. Also, pond operations could be adjusted to reduce conditions that would be stressful to fish (e.g., periodically increase flow-through rates or reduce salinities). Therefore, the relative risk of fish die-offs in the SCH ponds would be lower compared to the Salton Sea under current conditions. The risk of avian cholera in the SCH ponds would likely be similar to or lower than the risk in existing wildlife ponds at Sonny Bono NWR or IWAs Wister Unit, where densities of waterfowl are higher than expected at the SCH ponds. To reduce the risk of disease transmission and spread, the SCH ponds are designed to allow boat access for monitoring and removal of bird carcasses, if necessary. Impacts of avian diseases from the Project would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Impact BIO-5c: Project construction and operation would benefit common fish (native and nonnative) and wildlife species (beneficial impact). The SCH Project would benefit fish and aquatic invertebrates by restoring habitat that is more stable than the Sea's and with salinity near that of seawater. The SCH ponds would be specifically designed for piscivorous birds such as the American white pelican, Caspian tern, and double-crested cormorant, and habitat within the Project ponds would include the shallow water they require for foraging, a food source, and constructed islands that provide predator protection for resting and nesting. The amount of fish available for these birds would increase as the fish populations in the ponds develop and stabilize, and fish density should be higher than prior to Project construction. Providing forage fish as conditions in the Sea exceed the tolerance of fish currently present and the addition of islands protected from predators are beneficial impacts of the Project.

Compared to the No Action Alternative, the Project would result in a temporary loss of shallow shoreline habitat (approximately same amount as current conditions), but may result in changes to the invertebrate food base for species that rely on invertebrate food. If that occurs, the Project would be a beneficial impact for the species compared to the No Action Alternative by providing foraging opportunities that may not exist under future conditions. The Project would replace that temporary loss with equal or greater shoreline and provide a food source that may not exist under the No Action Alternative. For piscivorous birds, the Project would provide a food source as the source in the Salton Sea declines to a very low level with essentially no tilapia except in small areas at the drain and river outflows. The amount of fish provided, however, would be considerably less than that currently in the Sea and would support a smaller number of piscivorous birds. Consequently, after the Sea's salinity exceeds the tolerance of the fish species used by the birds, the Project would be the primary source of forage fish at the Sea, and the piscivorous bird populations would likely decline to match the more limited availability of food sources.

Overall, Alternative 1 could have beneficial impacts for piscivorous bird foraging and bird nesting on islands when compared to the existing environmental setting and the No Action Alternative. Although the Project would benefit common piscivorous bird foraging and nesting, a substantial decline in the numbers present at the Salton Sea would occur in the long term under No Action because the Project would support fewer birds.

3.4.4.5 Alternative 2 – New River, Pumped Diversion

Impact BIO-1a: Project construction and operation would affect habitat and individuals of desert pupfish and several special-status bird species (significant impact).

Desert Pupfish. Impacts on desert pupfish would be the same as described for Alternative 1, but the amount of shallow shoreline isolated would increase to 8.1 miles, and water from more existing agricultural drains would be collected into a third new drain interception ditch to the Salton Sea. MM BIO-1 would apply to Alternative 2 and would reduce impacts to less than significant.

Burrowing Owl. Construction impacts on the burrowing owl would be the same as described for Alternative 1; however, more existing agricultural drains within which burrowing owls could nest or winter would be collected into a third new drain interception ditch to the Sea, which could result in greater impacts. In contrast, the potential for impacts on burrowing owl habitat and nesting and wintering burrows would be reduced because no diversion structure and conveyance pipelines would be constructed. The sedimentation basins would be located at least partially within existing mudflat areas, thereby reducing the amount of existing potential burrowing owl habitat that would be affected. MM BIO-2 would apply to Alternative 2 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Operation and maintenance impacts on burrowing owls would be the same as described for Alternative 1; however, a low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq that could disrupt breeding of burrowing owls if burrows are present within the 60-dBA contour. MM BIO-2 and MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

California Black Rail and Yuma Clapper Rail. Impacts on the California black rail and Yuma clapper rail would be the same as described for Alternative 1; however, more existing agricultural drains would be collected into a third new drain interception ditch to the Salton Sea, which could result in greater impacts if suitable nesting habitat for either of these species is present where construction disturbances would occur. The potential for impacts on occupied freshwater marsh habitat would be reduced because no diversion structure, conveyance pipelines, and sedimentation basins would be constructed upstream along the New River. Operation and maintenance impacts for the drain interception ditch would be the same as described for Alternative 1. MM BIO-2 and MM BIO-4 would apply to Alternative 2 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1. MM BIO-3 would apply and would reduce impacts to less than significant.

Other Nesting Marsh Bird Species. Impacts on redhead, least bittern, and yellow-headed blackbird would be the same as described for Alternative 1; however, more existing agricultural drains would be collected into a third new drain interception ditch to the Sea, which could result in greater impacts if freshwater marsh habitat is present and redhead, least bittern, and/or yellow-headed blackbird are nesting there at the time of construction. Operation and maintenance impacts on redhead, least bittern, and yellow-headed blackbird would be the same as described for Alternative 1. MM BIO-2 and MM BIO-4 would apply to Alternative 2 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Western Snowy Plover. Impacts on western snowy plover would be the same as described for Alternative 1, but the amount of shoreline and shallow shoreline disturbed or lost would increase to 8.1 miles. MM BIO-2 would apply to Alternative 2 and would reduce impacts to less than significant. Construction noise impacts on western snowy plovers would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Operation of the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of the species if the pump is located adjacent to western snowy plover breeding habitat. MM BIO-2 and MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Riparian Bird Species. Impacts on white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher would be the same as described for Alternative 1; however, slightly more riparian habitat could be removed even though the upstream diversion structure, sedimentation basin, and conveyance pipelines would not be included in Alternative 2 (see Impact BIO-2). MM BIO-2 would apply to Alternative 2 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1 but would not extend upstream along the New River. MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Operation and maintenance impacts on riparian birds would be the same as described for Alternative 1; however, a low lift pump diversion at the SCH ponds would be located adjacent to the New River, which may have noise levels greater than 60 dBA Leq. Any breeding of these species within the 60-dBA contour could be disrupted. MM BIO-2 and MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Gull-Billed Tern and Black Skimmer. Impacts on gull-billed terns and black skimmers would be the same as described for Alternative 1, but the amount of shoreline and shallow shoreline water disturbed during construction would increase to 8.1 miles, which could result in increased impacts on nesting and foraging locations. MM BIO-2 would apply to Alternative 2 and would reduce impacts to less than significant. Construction noise and activity impacts would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Operation and maintenance impacts on gull-billed tern and black skimmer would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of these species if the pump is located adjacent to breeding locations. MM BIO-2 and MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Loggerhead Shrike. Impacts on loggerhead shrikes would be the same as described for Alternative 1; however, impacts on potential breeding habitat would be reduced because the upstream diversion, conveyance pipelines, and sedimentation basins would not be built. Sedimentation basins would still be built but adjacent to the ponds in areas less likely to have potential breeding habitat for this species. This reduction would be at least partially offset by the increased amount of shoreline temporarily affected by construction activities. MM BIO-2 would apply to Alternative 2 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Operation and maintenance impacts on loggerhead shrike would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of the species if the pump is located adjacent to breeding habitat. MM BIO-2 and MM BIO-3 would apply to Alternative 2 and would reduce impacts to less than significant.

Impact BIO-1b: Project construction and operation would have minor effects on habitat and individuals of several special-status species (less-than-significant or no impact).

Desert Pupfish. Effects of mosquito control activities would be less than significant as described for Alternative 1.

California Black Rail and Yuma Clapper Rail. The sedimentation basins would be located adjacent to the ponds and would be at least 1,000 feet away from existing marsh habitat. Impacts of construction noise would be less than significant at that distance from potential habitat for these species. Impacts of pond and sedimentation basin operation and maintenance on the California black rail or Yuma clapper rail would be the same as described for Alternative 1. The low lift pump diversion at the SCH ponds would be located near the Sea's shoreline more than 1,000 feet from any freshwater marsh habitat. Thus, noise from this pump is not expected to exceed 60 dBA Leq at that habitat, and impacts of noise would be less than significant.

Other Nesting Marsh Bird Species. As described for the California black rail and Yuma clapper rail, impacts of an upstream diversion, conveyance pipelines, and sedimentation basin would not occur. Sedimentation basins would still be built but adjacent to the ponds and would be at least 1,000 feet away from existing marsh habitat. The low lift pump diversion at the SCH ponds would be located near the Sea's shoreline more than 1,000 feet from any freshwater marsh habitat. Thus, noise from this pump is not expected to exceed 60 dBA Leq at that habitat, and impacts of noise would be less than significant.

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 1; impacts would be less than significant.

Impact BIO-1c: Project operation would provide habitat for desert pupfish and several special-status bird species (beneficial impact). The SCH ponds would provide the same beneficial habitat effects for desert pupfish and special-status bird species as described for Alternative 1, but the area of the ponds would be less (about 460 acres) at approximately 2,670 acres.

Impact BIO-2: Project construction and operation would cause a temporary disturbance or loss of riparian habitat and/or sensitive habitat (significant impact). Potential losses of riparian habitat under Alternative 2 may be slightly more than under Alternative 1 because a larger area of riparian habitat could be disturbed for pond construction along the Salton Sea's shore. Impacts on riparian vegetation are anticipated to be up to approximately 102 acres and would be significant.

No impact would occur to mesquite bosque because it occurs outside the Project disturbance area.

Mitigation Measures

Mitigation Measure MM BIO-5 would apply to Alternative 2.

Residual Impact

Implementation of MM BIO-5 would reduce impacts to less than significant.

Impact BIO-3a: Project construction would result in temporary disturbance of Federal Waters of the U.S. and minimal effects on wetlands (less-than-significant impact). Temporary disturbance of Waters of the U.S. during construction of Alternative 2 would be less than under Alternative 1 (approximately 662 acres) because the aerial extent of the Sea that would be displaced by the ponds is less. As discussed under Alternative 1, minor losses associated with construction of berms and other facilities would result in a small loss of Waters of the U.S. (approximately 13 acres), but the Project would provide a net increase of 1,995 acres (see Impact BIO-3b). Similar to Alternative 1, operation and maintenance of the ponds and associated facilities would cause temporary disturbances to Waters of the U.S. at intervals during the Project life.

Effects on wetlands would be approximately the same as for Alternative 1. Impacts on wetlands and other Waters of the U.S. would be less than significant.

Implementation of MM BIO-4 would avoid less-than-significant impacts of the interception ditches on adjacent wetlands.

Impact BIO-3b: Project operation would increase the amount of Federal Waters of the U.S. (beneficial impact). Compared to existing conditions, Alternative 2 would result in a net increase in the extent of Waters of the U.S. of about 1,995 acres, more than Alternative 1. With the Sea's anticipated receding shoreline under the No Action Alternative, the amount would increase up to the entire pond area (minus berms and islands). As for Alternative 1, the Project is anticipated to also improve the quality of Waters of the U.S. within the area occupied by the SCH ponds compared to existing conditions and the No Action Alternative, and overall impacts would be beneficial.

Impact BIO-4: Project construction and operation would not interfere with movement of fish and wildlife species, but construction could remove snags for colonial nesting birds (less-than-significant impact). The impact analysis for aquatic species in Impact BIO-4 of Alternative 1 would apply to Alternative 2, and impacts would be less than significant.

Impacts on colonial nesting birds would be the same as described for Alternative 1, but a little more riparian vegetation could be affected, even with no construction of an upstream diversion structure and conveyance pipelines (see Impact BIO-2).

Implementation of MM BIO-5 would further reduce these less-than-significant impacts.

Impact BIO-5a: Project construction and operation could affect nesting by some common bird species and introduction of invasive species (significant impact). Impacts on common native wildlife species would be the same as described for Alternative 1; however, more existing agricultural drains within which common bird species could nest would be collected into the new interception ditch, draining to the Salton Sea, which could result in greater impacts. In contrast, impacts on potential common bird nesting habitats would be reduced because no upstream diversion, conveyance pipelines, and sedimentation basin would be built. Construction of the sedimentation basins adjacent to the ponds would affect less common bird potential nesting habitat than at the upstream site.

Operation and maintenance impacts on common native wildlife species would be as described for Alternative 1; however, a low lift pump diversion at the SCH ponds, which may have noise levels greater than 60 dBA Leq, could disrupt breeding of common bird species within the 60 dBA noise contour.

The potential for introduction of invasive species would be the same as described for Alternative 1.

Mitigation Measures

MM BIO-2, MM BIO-3, and MM BIO-6 would apply to Alternative 2.

Residual Impact

Implementation of MM BIO-2, MM BIO-3, and MM BIO-6 would reduce impacts to less than significant.

Impact BIO-5b: Project construction and operation would have minor effects on common fish (native and nonnative), wildlife species, and native plant communities (less-than-significant or no impact). No upland common native plant communities are present as described for Alternative 1, and no impacts would occur.

Effects of diversion entrainment, reduced river flows downstream of the diversion, and water quality fluctuations in the SCH ponds on aquatic biota and temporary construction disturbances of shallow shoreline and terrestrial habitat on birds and terrestrial wildlife would be the same as described under Alternative 1, and impacts would be less than significant when compared to the existing environmental setting and the No Action Alternative. Operation of the pump stations and sedimentation basins would have effects similar to those described for Alternative 1, but the two sedimentation basins would total 40 acres (20 less than for Alternative 1).

Effects of selenium uptake, pesticides (Table 3.4-5), and avian diseases on common bird species would be essentially the same as described for Alternative 1. Impacts would be less than significant.

Impact BIO-5c: Project construction and operation would benefit common fish (native and nonnative) and wildlife species (beneficial impact). The beneficial effects of the ponds for aquatic species would be the same as for Alternative 1 except that less pond habitat (approximately 460 acres) would be present.

3.4.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Alternative 3 would be similar to Alternative 2 with the addition of cascading ponds on the seaward side of those ponds, resulting in a larger (400 acres) total pond area of 2,900 acres.

Impact BIO-1a: Project construction and operation would affect habitat and individuals of desert pupfish and several special-status bird species (significant impact).

Desert Pupfish. Impacts on desert pupfish would be the same as described for Alternative 1, but the amount of shallow shoreline isolated would increase to 8.1 miles, and water from more existing agricultural drains would be collected into a third new drain interception ditch to the Salton Sea as in Alternative 2. MM BIO-1 would apply to Alternative 3 and would reduce impacts to less than significant.

Burrowing Owl. Construction impacts on the burrowing owl would be the same as described for Alternative 1; however, more existing agricultural drains within which burrowing owls could nest or winter would be collected into the new interception ditch draining to the Sea, which could result in greater impacts as described in Alternative 2. In contrast, the potential for impacts on burrowing owl habitat and nesting and wintering burrows would be reduced because no diversion structure and conveyance pipelines would be constructed. The sedimentation basins would be located at least partially within existing mudflat areas, thereby reducing the amount of existing potential burrowing owl habitat that would be affected. MM BIO-2 would apply to Alternative 3 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Operation and maintenance impacts on burrowing owls would be the same as described for Alternative 1; however, a low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq that could disrupt breeding of burrowing owls if burrows are present within the 60-dBA contour. MM BIO-2 and MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

California Black Rail and Yuma Clapper Rail. Construction, operation, and maintenance impacts on the California black rail and Yuma clapper rail would be the same as described for Alternative 1; however, more existing agricultural drains would be collected into a third new drain interception ditch to the Salton Sea as described in Alternative 2. The potential for impacts on occupied freshwater marsh habitat would be reduced because no diversion structure, conveyance pipelines, and sedimentation basins would be constructed upstream along the New River. The sedimentation basins would be located adjacent to the ponds and would be at least 1,000 feet away from existing marsh habitat. MM BIO-2 and MM BIO-4 would apply to Alternative 3 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1. MM BIO-3 would apply and would reduce impacts to less than significant.

Other Nesting Marsh Bird Species. Impacts on redhead, least bittern, and yellow-headed blackbird would be the same as described for Alternative 1; however, more existing agricultural drains would be collected into a third new drain interception ditch to the Sea as described in Alternative 2. Operation and maintenance impacts on redhead, least bittern, and yellow-headed blackbird would be the same as described for Alternative 1. MM BIO-2 and MM BIO-4 would apply to Alternative 3 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Western Snowy Plover. Impacts on western snowy plover would be the same as described for Alternative 1, but the amount of shoreline and shallow shoreline disturbed or lost would increase to 8.1 miles. MM BIO-2 would apply to Alternative 3 and would reduce impacts to less than significant.

Construction noise impacts on western snowy plovers would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Operation of the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of the species if the pump is located adjacent to western snowy plover breeding habitat. MM BIO-2 and MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Riparian Bird Species. Impacts on white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher would be the same as described for Alternative 1; however, slightly more riparian habitat could be removed as described for Alternative 2 (see Impact BIO-2). MM BIO-2 would apply to Alternative 3 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1 but would not extend upstream along the New River. MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Operation and maintenance impacts on riparian birds would be the same as described for Alternative 1; however, a low lift pump diversion at the SCH ponds would be located adjacent to the New River, which may have noise levels greater than 60 dBA Leq. Any breeding of these species within the 60-dBA contour could be disrupted. MM BIO-2 and MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Gull-Billed Tern and Black Skimmer. Impacts on gull-billed terns and black skimmers would be the same as described for Alternative 1, but the amount of shoreline and shallow shoreline water disturbed during construction would increase to 8.1 miles, which could result in increased impacts on nesting and foraging locations. MM BIO-2 would apply to Alternative 3 and would reduce impacts to less than significant. Construction noise and activity impacts would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Operation and maintenance impacts on gull-billed tern and black skimmer would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of these species if the pump is located adjacent to breeding locations. MM BIO-2 and MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Loggerhead Shrike. Impacts on loggerhead shrikes would be the same as described for Alternative 1; however, impacts on potential breeding habitat would be reduced because the upstream diversion, conveyance pipelines, and sedimentation basins would not be built. Sedimentation basins would still be built but adjacent to the ponds in areas less likely to have potential breeding habitat for this species. This reduction would be at least partially offset by the increased amount of shoreline temporarily affected by construction activities. MM BIO-2 would apply to Alternative 3 and would reduce impacts to less than significant. Construction noise and activity would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Operation and maintenance impacts on loggerhead shrike would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of the species if the pump is located adjacent to breeding habitat. MM BIO-2 and MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

Impact BIO-1b: Project construction and operation would have minor effects on habitat and individuals of several special-status species (less-than-significant or no impact).

Desert Pupfish. Effects of mosquito control activities would be less than significant as described for Alternative 1.

California Black Rail and Yuma Clapper Rail. Operation and maintenance impacts on the California black rail or Yuma clapper rail would be the same as described for Alternative 1. The low lift pump diversion at the SCH ponds would be located near the Sea's shoreline more than 1,000 feet from any freshwater marsh habitat. Thus, noise from this pump is not expected to exceed 60 dBA Leq at that habitat, and impacts of noise would be less than significant.

Other Nesting Marsh Bird Species. As described for the California black rail and Yuma clapper rail, impacts of an upstream diversion, conveyance pipelines, and sedimentation basin would not occur. Sedimentation basins would still be built but adjacent to the ponds and would be at least 1,000 feet away from existing marsh habitat. The low lift pump diversion at the SCH ponds would be located near the Sea's shoreline more than 1,000 feet from any freshwater marsh habitat. Thus, noise from this pump is not expected to exceed 60 dBA Leq at that habitat, and impacts of noise would be less than significant.

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 1; impacts would be less than significant.

Impact BIO-1c: Project operation would provide habitat for desert pupfish and several special-status bird species (beneficial impact). The SCH ponds would provide the same beneficial habitat effects for desert pupfish and special-status bird species as described for Alternative 1, but the area of the ponds would be 460 acres greater at approximately 3,770 acres.

Impact BIO-2: Project construction and operation would cause a temporary disturbance or loss of riparian habitat and/or sensitive habitat (significant impact). Potential losses of riparian habitat under Alternative 3 would be very similar to Alternative 2 (up to about 106 acres) because pond layout and divisions would be essentially the same, where they overlap with riparian habitat. These impacts would be significant.

As for Alternative 2, no impact would occur to mesquite bosque because it occurs outside the Project disturbance area.

Mitigation Measures

Mitigation Measure MM BIO-5 would apply to Alternative 2.

Residual Impact

Implementation of MM BIO-5 would reduce impacts to less than significant.

Impact BIO-3a: Project construction would result in temporary disturbance of Federal Waters of the U.S. and minimal effects on wetlands (less-than-significant impact). Temporary disturbance of Waters of the U.S. during construction of Alternative 3 would be more than under Alternative 1 (approximately 1,760 acres) because the aerial extent of the Sea that would be displaced by the ponds is more. As discussed under Alternative 1, although construction of berms and other facilities would result in a small loss of Waters of the U.S. (approximately 24 acres), an overall increase of 1,986 acres would occur. Similar to Alternative 1, operation and maintenance of the ponds and associated facilities would cause temporary disturbances to Waters of the U.S. at intervals during the Project life.

Effects on wetlands would be approximately the same as for Alternative 1. Impacts on wetlands and other Waters of the U.S. would be less than significant.

Implementation of MM BIO-4 would avoid less-than-significant impacts of the interception ditches on adjacent wetlands.

Impact BIO-3b: Project operation would increase the amount of Federal Waters of the U.S. (beneficial impact). Alternative 3 would result in a net increase in the extent of Waters of the U.S. of about 1,986 acres as compared to existing conditions, similar to Alternative 2. With the Sea's anticipated receding shoreline under the No Action Alternative, the amount would increase up to the entire pond area (minus berms and islands). As for Alternative 1, the Project is anticipated to also improve the quality of Waters of the U.S. within the area occupied by the SCH ponds, and overall impacts would be beneficial.

Impact BIO-4: Project construction and operation would not interfere with movement of fish and wildlife species, but construction could remove snags for colonial nesting birds (less-than-significant impact). The impact analysis for aquatic species in Impact BIO-4 of Alternative 1 would apply to Alternative 3, and impacts would be less than significant.

Impacts on colonial nesting birds would be less than significant as described for Alternative 2.

Implementation of MM BIO-5 would further reduce these less-than-significant impacts.

Impact BIO-5a: Project construction and operation could affect nesting by some common bird species and introduction of invasive species (significant impact). Construction impacts on common native wildlife species would be the same as described for Alternative 1; however, more existing agricultural drains within which common bird species could nest would be collected into the new interception ditch draining to the Salton Sea, which could result in greater impacts as in Alternative 2. In contrast, impacts on potential common bird nesting habitats would be reduced because no upstream diversion, conveyance pipelines, and sedimentation basins would be built. Construction of the sedimentation basins adjacent to the ponds would affect less common bird potential nesting habitat than at the upstream site. MM BIO-2 would apply to Alternative 3 and would reduce impacts to less than significant.

Operation and maintenance impacts on common native wildlife species would be as described for Alternative 1; however, a low lift pump diversion at the SCH ponds, which may have noise levels greater than 60 dBA Leq, could disrupt breeding of common bird species. MM BIO-2 and MM BIO-3 would apply to Alternative 3 and would reduce impacts to less than significant.

The potential for introduction of invasive species would be the same as described for Alternative 1. MM BIO-6 would apply to Alternative 3 and would reduce impacts to less than significant.

Impact BIO-5b: Project construction and operation would have minor effects on common fish (native and nonnative), wildlife species, and native plant communities (less-than-significant or no impact). No upland common native plant communities are present as described for Alternative 1, and no impacts would occur.

Effects of diversion entrainment, reduced river flow downstream of the diversion, and water quality fluctuations in the SCH ponds on aquatic biota and temporary disturbance of shallow shoreline and terrestrial habitat on birds and terrestrial wildlife would be the same as described under Alternative 1, and impacts would be less than significant when compared to the existing environmental setting and the No Action Alternative. Operation of pump stations and sedimentation basins would have effects similar to

those described for Alternative 1, but the sedimentation basins would total 70 acres (10 more than for Alternative 1). Effects of selenium uptake, pesticides (Table 3.4-5), and avian diseases on common bird species would be essentially the same as described for Alternative 1. Impacts would be less than significant.

Impact BIO-5c: Project construction and operation would benefit common fish (native and nonnative) and wildlife species (beneficial impact). The beneficial effects of the ponds for aquatic species would be the same as for Alternative 1 except that a little more pond habitat (approximately 640 acres) would be present.

3.4.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact BIO-1a: Project construction and operation would affect habitat and individuals of desert pupfish and several special-status bird species (significant impact).

Desert Pupfish. Impacts on desert pupfish would be the same as described for Alternative 1, except that the amount of shallow shoreline isolated would be approximately 2.6 miles adjacent to the northern side of the Alamo River (excluding inside Morton Bay). Fewer existing agricultural drains would be collected in a single interception ditch. MM BIO-1 would apply to Alternative 4 and would reduce impacts to less than significant.

Burrowing Owl. Impacts of construction activities on burrowing owls would be the same as described for Alternative 1 but near the Alamo River and adjacent to Red Hill for the pump station and pipeline for saline water. Fewer agricultural drains within which burrowing owls could nest would be collected in a single interception ditch. MM BIO-2 would apply to Alternative 4 and would reduce impacts to less than significant. Construction noise and activity impacts would be the same as described for Alternative 1 but also include the pump station at Red Hill. MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant. Operation and maintenance impacts on burrowing owls would be the same as described for Alternative 1 but include noise from the pump station. MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

California Black Rail and Yuma Clapper Rail. Construction impacts on California black rail and Yuma clapper rail would be the same as described for Alternative 1; however, fewer drains within which freshwater marsh habitat may be present for nesting of the California black rail or Yuma clapper rail could be affected. Large patches of suitable habitat in Sonny Bono NWR are adjacent to the SCH Project, and individual rails present in that habitat could be affected by construction noise. MM BIO-2 and MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Operation and maintenance impacts on California black rail or Yuma clapper rail would be the same as described for Alternative 1, but the interception ditch could affect marsh habitat adjacent to Wister Beach. In addition, noise from operation and maintenance of Project components, primarily the river water and saline water conveyance pipelines, located adjacent to areas in Sonny Bono NWR that may contain suitable habitat for the species could also affect these species. MM BIO-2, MM BIO-3, and MM BIO-4 would apply to Alternative 4 and would reduce impacts to less than significant.

Other Nesting Marsh Bird Species. Construction impacts on redhead, least bittern, and yellow-headed blackbird would be the same as described for Alternative 1; however, fewer drains within which freshwater marsh habitat may be present for nesting of these species would be affected. Large patches of suitable habitat in Sonny Bono NWR are adjacent to the Project area, and any marsh birds nesting in that habitat could be affected by construction noise. MM BIO-2 and MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Operation and maintenance impacts on redhead, least bittern, and yellow-headed blackbird would be the same as described for Alternative 1 but at marshes near the Alamo River and Wister Beach. Noise impacts from operation and maintenance of Project components located adjacent to areas that may contain suitable habitat for the species could also occur. MM BIO-2, MM BIO-3, and MM BIO-4 would apply to Alternative 4 and would reduce impacts to less than significant.

Western Snowy Plover. Construction and operation impacts on western snowy plover would be the same as described for Alternative 1, but the amount of shoreline and shallow shoreline disturbed or lost would decrease to 2.6 miles. Some areas of shallow shoreline within Morton Bay would also be lost due to increased water surface elevation compared to existing conditions. MM BIO-2 would apply to Alternative 4 and would reduce impacts to less than significant. Construction and operation noise and activity effects would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Riparian Bird Species. Construction impacts on white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher would be the same as described for Alternative 1, but slightly less habitat could be affected (see Impact BIO-2). MM BIO-2 and MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Operation and maintenance impacts on white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Gull-Billed Tern and Black Skimmer. Construction impacts on gull-billed terns and black skimmers would be the same as described for Alternative 1, but, although the amount of shoreline and shallow shoreline along the Sea temporarily disturbed would decrease to 2.6 miles (excluding shoreline of Morton Bay), these species have nested along Morton Bay's shoreline, which could result in increased impacts on nesting locations. MM BIO-2 and MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Operation and maintenance impacts on gull-billed terns and black skimmers would be the same as described for Alternative 1. MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Loggerhead Shrike. Construction impacts on loggerhead shrike would be the same as described for Alternative 1. In addition, the species could also occur on Red Hill near the pump station location. MM BIO-2 and MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Operation and maintenance impacts on loggerhead shrike would be the same as described for Alternative 1, although noise from the pump station next to Red Hill could affect nesting if sound levels exceeding 60 dBA were present in nesting habitat. MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Impact BIO-1b: Project construction and operation would have minor effects on habitat and individuals of several special-status species (less-than-significant or no impact).

Desert Pupfish. Effects of mosquito control activities would be less than significant as described for Alternative 1.

California Black Rail, Yuma Clapper Rail, and Other Nesting Marsh Bird Species. Operation and maintenance impacts on the California black rail or Yuma clapper rail and nesting marsh birds would be the same as described for Alternative 1, less than significant.

Western Snowy Plover. Operation and maintenance of the pump station to bring saline water to the ponds is unlikely to disrupt breeding of the western snowy plover because little to no suitable nesting habitat is present at that location. Impacts would be less than significant.

Riparian Bird Species. Impacts of operation and maintenance of the pump station for saline water would be the same as described for Alternative 1, except near the Alamo River. No impacts would occur as no nesting habitat is present at that location.

Gull-Billed Tern and Black Skimmer. Construction impacts would be the same as described for Alternative 1, less than significant.

Loggerhead Shrike. Impacts of operation and maintenance activities for the ponds would be the same as described for Alternative 1, less than significant.

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts of construction, operation, and maintenance on these species would be the same as described for Alternative 1; impacts would be less than significant.

Impact BIO-1c: Project operation would provide habitat for desert pupfish and several special-status bird species (beneficial impact). The SCH ponds would provide the same type of beneficial habitat effects for desert pupfish and special-status bird species as described for Alternative 1, but the area of the ponds (2,290 acres) would be approximately 840 acres less.

Impact BIO-2: Project construction and operation would cause a temporary disturbance or loss of riparian habitat and/or sensitive habitat (significant impact). Potential losses of riparian habitat under Alternative 4 would be less than for Alternative 1 because the amount of riparian habitat that could be removed to construct the ponds would be less. Somewhat more naturally occurring riparian habitat is present along the Alamo River, where the diversion would likely be constructed, than at the New River. However, that is a relatively small proportion of the riparian area that could be disturbed.

In addition to impacts on riparian habitat, mesquite bosque could be impacted where it has been planted at the northern end of Hatfield Road in the IWA. Hence, impacts on riparian vegetation and mesquite bosque could be about the same or slightly less than for Alternative 1, and would be considered a significant impact when compared to the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM BIO-5 would apply to Alternative 4.

Residual Impact

Implementation of MM BIO-5 would reduce impacts to less than significant.

Impact BIO-3a: Project construction would result in temporary disturbance of Federal Waters of the U.S. and minimal effects on wetlands (less-than-significant impact). Temporary disturbance of Waters of the U.S. under Alternative 4 would be substantially less than for Alternative 1 (approximately 980 acres) because the aerial extent of the Sea that would be displaced by the ponds is much less. As discussed under Alternative 1, although construction of berms and other facilities would result in a small

loss of Waters of the U.S. (approximately 10 acres), the Project would have a net increase in Waters of the U.S. of 1,300 acres (see Impact BIO-3b). Similar to Alternative 1, operation and maintenance of the ponds and associated facilities would cause temporary disturbances to Waters of the U.S. at intervals during the Project life.

Effects on wetlands would be approximately the same as for Alternative 1. Impacts on wetlands and other Waters of the U.S. would be less than significant.

Implementation of MM BIO-4 would avoid the less-than-significant impacts of the interception ditches on wetlands.

Impact BIO-3b: Project operation would increase the amount of Federal Waters of the U.S. (beneficial impact). Compared to existing conditions, Alternative 4 would result in a net increase in the extent of Waters of the U.S. of about 1,300 acres, less than for Alternative 1. With the Sea's anticipated receding shoreline under the No Action Alternative, the amount would increase up to the entire pond area (minus berms and islands). As for Alternative 1, the Project is anticipated to also improve the quality of Waters of the U.S. within the area occupied by the SCH ponds compared to existing environmental conditions and the No Action Alternative, and overall impacts would be beneficial.

Impact BIO-4: Project construction and operation would not interfere with movement of fish and wildlife species, but construction could remove snags for colonial nesting birds (less-than-significant impact). The impact analysis for aquatic species in Impact BIO-4 of Alternative 1 would apply to Alternative 4, but the effects would be adjacent to or in the Alamo River, and impacts would be less than significant.

The less-than-significant impacts on colonial nesting birds would be essentially the same as described for Alternative 1 but at the Alamo River. However, the saline water pump station would be on land and not isolated but could still be used by birds for nesting or roosting.

Implementation of MM BIO-5 would further reduce the less-than-significant impacts on nesting birds.

Impact BIO-5a: Project construction and operation could affect nesting by some common bird species and introduction of invasive species (significant impact). Construction impacts on nesting by common bird species would be the same as described for Alternative 1. MM BIO-2 and MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Operation and maintenance impacts on nesting by common bird species would be the same as described for Alternative 1, but at the Alamo River. MM BIO-2 and MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

The potential for introduction of invasive species would be the same as described for Alternative 1. MM BIO-6 would apply to Alternative 4 and would reduce impacts to less than significant.

Impact BIO-5b: Project construction and operation would have minor effects on common fish (native and nonnative), wildlife species, and native plant communities (less-than-significant impact). Common native plant communities in the Project area are very limited in extent and include two types of saltbush scrub: desert holly scrub and quailbush scrub at Red Hill. Due to the abundance of these plant communities in the Project region and the very limited extent in the Project area, disturbance or loss of small amounts of these plant communities would be a less-than-significant impact when compared to the existing environmental setting and the No Action Alternative.

Effects of diversion entrainment, reduced river flow downstream of the diversion, and water quality fluctuations in the SCH ponds on aquatic biota would be the same as described under Alternative 1, except that the effects would be at the Alamo River, and impacts would be less than significant. Project effects on shallow shoreline habitat and common terrestrial wildlife would be less than significant as described for Alternative 1. Operation of the pump station and sedimentation basin would have effects similar to those described for Alternative 1, except the sedimentation basin would be 37 acres (23 acres less than for Alternative 1).

Effects of selenium uptake, pesticides, and avian diseases on common bird species would be essentially the same as described for Alternative 1, although the risk of selenium uptake would be slightly higher due to the higher selenium concentration in Alamo River water than in New River water. Ecorisk modeling was used to predict potential selenium concentrations in water and biota for different Project alternatives and operations (river water blended with Salton Sea water to achieve 20 ppt or 35 ppt salinity in ponds) (Sickman et al. 2011, see Appendix I). For Alternative 4, predicted egg selenium concentrations would be 8.9 µg/g dw for ponds operated at 35 ppt, and 12.7 µg/g dw for ponds operated at 20 ppt. This amount exceeds the conservative toxicity threshold (>6.0 µg/g dw), which would increase the probability of reduced hatching success in some sensitive species, and approaches levels associated with teratogenesis in sensitive species (>12 µg/g dw). However, overall impacts on breeding birds using the SCH ponds would be less than significant for the reasons described under Alternative 1.

DDE exposure would be higher for Alternative 4 than Alternatives 1 to 3 due to the higher DDE concentrations measured in sediments near the Alamo River compared to the New River. The estimated DDE concentration of pond sediments for Alternative 4 compared to existing and No Project conditions showed an increase of 2.0 ng/g for estimates based on mean existing DDE concentrations and an increase of 12.6 ng/g for estimates using only the highest observed DDE concentration (Table 3.4-5). Existing maximum sediment DDE concentration exceeded the PEC concentration of 31.3 ng/g, as did the Alternative 4 maximum calculated estimate using the highest observed concentration. Impacts of DDE exposure from the Project would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Impact BIO-5c: Project construction and operation would benefit common fish (native and nonnative) and wildlife species (beneficial impact). The beneficial effects of the ponds for aquatic species would be the same as for Alternative 1 except near the Alamo River and less pond habitat (approximately 840 acres less) would be present.

3.4.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact BIO-1a: Project construction and operation would affect habitat and individuals of desert pupfish and several special-status bird species (significant impact).

Desert Pupfish. Impacts on desert pupfish would be the same as described for Alternative 1, except that the amount of shallow shoreline along the Sea isolated would be 4.1 miles adjacent to the Alamo River (excluding Morton Bay). MM BIO-1 would apply to Alternative 5 and would reduce impacts to less than significant.

Burrowing Owl. Construction impacts on burrowing owls would be the same as described for Alternative 1, but near the Alamo River. However, fewer existing agricultural drains within which burrowing owl could nest or winter would be collected into the new interception ditch, which could result in less potential for impacts than for Alternative 1 and the same as for Alternative 4. As described for Alternative 2, the potential for impacts on burrowing owl habitat and nesting and wintering burrows would be reduced because no upstream diversion structure, conveyance pipelines, and sedimentation

basins would be constructed. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant. Operation and maintenance impacts on burrowing owls would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of burrowing owls if burrows are present within the 60-dBA noise contour. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

California Black Rail and Yuma Clapper Rail. Construction impacts on the California black rail and Yuma clapper rail would be the same as described for Alternative 4. The potential for impacts on occupied freshwater marsh habitat would be reduced because no diversion structure, conveyance pipelines, and sedimentation basins would be constructed upstream along the Alamo River. Although construction of the northern pond along Wister Beach would be greater than 500 feet from known Yuma clapper rail observation locations, freshwater marsh is present less than 500 feet from the Project, and rails could use that habitat, which would increase the potential for noise impacts on these species. MM BIO-2 and MM BIO-3 would apply to Alternative 4 and would reduce impacts to less than significant.

Operation and maintenance impacts during drain interception ditch maintenance on California black rail or Yuma clapper rail would be the same as described for Alternative 1, but the interception ditch could affect marsh habitat adjacent to Wister Beach. MM BIO-2, MM BIO-3, and MM BIO-4 would apply to Alternative 5 and would reduce impacts to less than significant.

Other Nesting Marsh Bird Species. Construction impacts on redhead, least bittern, and yellow-headed blackbird would be the same as described for Alternatives 1 and 4. Compared to Alternative 4, the potential for impacts on occupied freshwater marsh habitat would be reduced because no upstream diversion structure, conveyance pipelines, and sedimentation basins would be built. Maintenance of the drain interception ditch would have the potential to affect breeding marsh birds as described for Alternative 1. MM BIO-2, MM BIO-3, and MM BIO-4 would apply to Alternative 4 and would reduce impacts to less than significant.

Western Snowy Plover. Construction impacts on western snowy plover would be the same as described for Alternative 1, but the amount of shoreline and shallow shoreline along the Sea disturbed or lost would decrease to 4.1 miles (excluding Morton Bay). MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

Operation of the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of the species if the pump is located adjacent to breeding habitat. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

Riparian Bird Species. Construction impacts on white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher would be the same as described for Alternatives 1 and 4; impacts on riparian habitat would be approximately the same even with no upstream diversion structure, sedimentation basin, and conveyance pipelines in Alternative 5. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

Operation and maintenance impacts on white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher would be the same as described for Alternatives 1 and 4; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq that could disrupt breeding of these species in the adjacent riparian habitat along the Alamo River. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

Gull-Billed Tern and Black Skimmer. Impacts on gull-billed tern and black skimmer would be the same as described for Alternative 4, but the amount of shoreline and shallow shoreline temporarily disturbed would increase to 4.1 miles (excluding the shoreline of Morton Bay), which could result in increased impacts on nesting and foraging locations. In addition, these species have nested along Morton Bay's shoreline; hence, increased impacts on nesting locations could occur. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

Operation and maintenance impacts on the gull-billed tern and black skimmer would be the same as described for Alternative 4; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of these species if the pump is located adjacent to breeding locations. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

Loggerhead Shrike. Construction impacts on loggerhead shrikes would be the same as described for Alternative 1; however, impacts on potential breeding habitat would be reduced because construction of the upstream diversion structure, sedimentation basin, and conveyance pipelines would not occur. A sedimentation basin would still be built but adjacent to the ponds in an area less likely to have potential breeding habitat for this species. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

Operation and maintenance impacts on loggerhead shrike would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of the species if the pump is located adjacent to breeding habitat. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

Impact BIO-1b: Project construction and operation would have minor effects on habitat and individuals of several special-status species (less-than-significant impact).

Desert Pupfish. Effects of mosquito control activities would be less than significant as described for Alternative 1.

California Black Rail and Yuma Clapper Rail. The low lift pump diversion at the SCH ponds would be at least 750 feet away from suitable habitat within Sonny Bono NWR and noise levels greater than 60 dBA Leq would not be expected at those habitats. Impacts would be less than significant.

Other Nesting Marsh Birds. Operation and maintenance of the saline water pump station would have no impacts on nesting marsh birds because no nesting habitat is nearby. Operation and maintenance of the diversion pump station would have less-than-significant impacts on marsh bird nesting due to the distance of nesting habitat from this facility.

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 4; impacts would be less than significant.

Impact BIO-1c: Project operation would provide habitat for desert pupfish and several special-status bird species (beneficial impact). The SCH ponds would provide the same beneficial effects for desert pupfish and special-status bird species as described for Alternative 1, but the area of the ponds would be less (about 420 acres) at approximately 2,080 acres.

Impact BIO-2: Project construction and operation would cause a temporary disturbance or loss of riparian habitat and/or sensitive habitat (significant impact). Potential losses of riparian habitat under

Alternative 5 would be approximately the same as for Alternative 1 (up to about 90 acres) because the amount of riparian habitat that could be removed to construct the ponds would be about the same.

No impacts on mesquite bosque would occur because it is not present within the Project footprint.

Impacts on riparian vegetation would be about the same as for Alternative 1 and would be considered a significant impact when compared to the existing environmental setting and the No Action Alternative. MM BIO-5 would apply to Alternative 5 and would reduce impacts to less than significant.

Impact BIO-3a: Project construction would result in temporary disturbance of Federal Waters of the U.S. and minimal effects on wetlands (less-than-significant impact). Temporary disturbance of Waters of the U.S. under Alternative 5 would be about half that under Alternative 1 (approximately 840 acres) because the aerial extent of the Sea that would be displaced by the ponds is much less. As discussed under Alternative 1, although construction of berms and other facilities would result in a small loss of Waters of the U.S. (approximately 8 acres), the Project would have a net increase in Waters of the U.S. of 1,232 acres (see Impact BIO-3b). Similar to Alternative 1, operation and maintenance of the ponds and associated facilities would cause temporary disturbances to Waters of the U.S. at intervals during the Project life.

Effects on wetlands would be approximately the same as for Alternative 1. Impacts on wetlands and other Waters of the U.S. would be less than significant.

Implementation of MM BIO-4 would avoid the less-than-significant impacts of the interception ditches.

Impact BIO-3b: Project operation would increase the amount of Federal Waters of the U.S. (beneficial impact). Compared to existing conditions, Alternative 5 would result in a net increase in the extent of Waters of the U.S. of about 1,232 acres, less than for Alternative 1. With the Sea's anticipated receding shoreline under the No Action Alternative, the amount would increase up to the entire pond area (minus berms and islands). As for Alternative 1, the Project is anticipated to also improve the quality of Waters of the U.S. within the area occupied by the SCH ponds compared to existing environmental conditions and the No Action Alternative, and overall impacts would be beneficial.

Impact BIO-4: Project construction and operation would not interfere with movement of fish and wildlife species, but construction could remove snags for colonial nesting birds (less-than-significant impact). The impact analysis for aquatic species in Alternative 1 would apply to Alternative 5, but the effects would be adjacent to or in the Alamo River, and impacts would be less than significant.

Impacts on colonial nesting birds would be the same as described for Alternative 1, including impacts on riparian vegetation.

Implementation of MM BIO-5 would further reduce the less-than-significant impacts on colonial nesting birds.

Impact BIO-5a: Project construction and operation could affect nesting by some common bird species and introduction of invasive species (significant impact). Construction impacts on nesting by common bird species would be the same as described for Alternative 4. As described in Alternative 2, the potential for impacts on common bird nesting habitats would be reduced because no upstream diversion structure, conveyance pipelines, and sedimentation basins would be built, and the sedimentation basin adjacent to the ponds would be in an area with less potential nesting habitat. MM BIO-2 would apply to Alternative 4 and would reduce impacts to less than significant.

Operation and maintenance impacts on nesting by common bird species would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of common bird species. MM BIO-2 and MM BIO-3 would apply to Alternative 5 and would reduce impacts to less than significant.

The potential for introduction of invasive species would be the same as described for Alternative 1. MM BIO-6 would apply to Alternative 5 and would reduce impacts to less than significant.

Impact BIO-5b: Project construction and operation would have minor effects on common fish (native and nonnative), wildlife species, and native plant communities (less-than-significant impact). The analysis described for native plant communities in Alternative 4 would apply to Alternative 5, and impacts would be less than significant.

Effects of diversion entrainment, reduced river flow downstream of the diversion, and water quality fluctuations in the SCH ponds on aquatic biota would be the same as described under Alternative 1, except that the effects would be at the Alamo River, and impacts would be less than significant. Operation of the pump stations and sedimentation basin would have effects similar to those described for Alternative 1, except the sedimentation basin would be 30 acres (half of that for Alternative 1).

Effects of avian diseases on common bird species would be essentially the same as described for Alternative 1. Effects of selenium uptake would be the same as described for Alternative 4. Effects of pesticides, namely DDE, would be the same as described for Alternative 4 for estimates based on mean DDE concentrations (<1 to 5.5 ng/g increase), and somewhat higher for estimates based on a maximum DDE concentration (<1 to 34.2 ng/g increase). This increase was observed for the Alamo River - Morton Bay area (66.6 ng/g), where an extreme outlier sample skewed estimates higher. Sediment concentrations exceeded the PEC of 31.3 ng/g only for those estimates calculated with the maximum DDE concentration. Compared to existing conditions and the No Action Alternative, impacts would be less than significant. Project effects on shallow shoreline habitat and common terrestrial wildlife would be less than significant as described for Alternative 1.

Impact BIO-5c: Project construction would benefit common fish (native and nonnative) and wildlife species (beneficial impact). Beneficial effects of the ponds for aquatic species would be the same as described for Alternative 1 but near the Alamo River; less pond habitat (approximately 1,050 acres) would be present.

3.4.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Alternative 6 would be similar to Alternative 5 with the addition of cascading ponds on the seaward side of the Alternative 5 ponds, resulting in a larger (860 acres) total pond area of 2,940 acres.

Impact BIO-1a: Project construction and operation would affect habitat and individuals of desert pupfish and several special-status bird species (significant impact).

Desert Pupfish. Impacts on desert pupfish would be the same as described for Alternative 1, except that the amount of shallow shoreline along the Sea isolated would be 4.1 miles adjacent to the Alamo River (excluding Morton Bay), and water from existing agricultural drains would be collected into one drain interception ditch to the Salton Sea as in Alternative 4. MM BIO-1 would apply to Alternative 6 and would reduce impacts to less than significant.

Burrowing Owl. Construction impacts on burrowing owls would be the same as described for Alternative 1, but near the Alamo River. However, fewer existing agricultural drains within which burrowing owl could nest or winter would be collected into a new drain interception ditch, which could

result in less potential for impacts than for Alternative 1 and the same as for Alternative 4. As described for Alternative 2, the potential for impacts on burrowing owl habitat and nesting and wintering burrows would be reduced because no upstream diversion structure, conveyance pipelines, and sedimentation basins would be constructed. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant. Operation and maintenance impacts on burrowing owls would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of burrowing owls if burrows are present within the 60-dBA noise contour. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

California Black Rail and Yuma Clapper Rail. Construction impacts on the California black rail and Yuma clapper rail would be the same as described for Alternative 4. The potential for impacts on occupied freshwater marsh habitat would be reduced because no diversion structure, conveyance pipelines, and sedimentation basins would be constructed upstream along the Alamo River. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Operation and maintenance impacts during drain interception ditch maintenance on California black rail or Yuma clapper rail would be the same as described for Alternative 1, but the interception ditch could affect marsh habitat adjacent to Wister Beach. MM BIO-2, MM BIO-3, and MM BIO-4 would apply to Alternative 6 and would reduce impacts to less than significant.

Other Nesting Marsh Bird Species. Construction impacts on redhead, least bittern, and yellow-headed blackbird would be the same as described for Alternatives 1 and 4. Compared to Alternative 4, the potential for impacts on occupied freshwater marsh habitat would be reduced because no upstream diversion structure, conveyance pipelines, and sedimentation basins would be built. Maintenance of the drain interception ditch would have the potential to affect breeding marsh birds as described for Alternative 1. MM BIO-2, MM BIO-3, and MM BIO-4 would apply to Alternative 6 and would reduce impacts to less than significant.

Western Snowy Plover. Construction impacts on western snowy plover would be the same as described for Alternative 1, but the amount of shoreline and shallow shoreline along the Sea disturbed or lost would decrease to 4.1 miles (excluding Morton Bay). MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Operation of the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of the species if the pump is located adjacent to breeding habitat. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Riparian Bird Species. Construction impacts on white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher would be the same as described for Alternatives 1 and 4; impacts on riparian habitat would be approximately the same as Alternative 1 even with no upstream diversion structure, sedimentation basin, and conveyance pipelines in Alternative 6 (see Impact BIO-2). MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Operation and maintenance impacts on white-tailed kite, little willow flycatcher, yellow-breasted chat, gila woodpecker, and crissal thrasher would be the same as described for Alternatives 1 and 4; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq that could disrupt breeding of these species in the adjacent riparian habitat along the Alamo River. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Gull-Billed Tern and Black Skimmer. Impacts on gull-billed tern and black skimmer would be the same as described for Alternative 4, but the amount of shoreline and shallow shoreline temporarily disturbed would increase to 4.1 miles (excluding Morton Bay), which could result in increased impacts on nesting and foraging locations. In addition, these species have nested along Morton Bay's shoreline; hence, increased impacts on nesting locations could occur. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Operation and maintenance impacts on the gull-billed tern and black skimmer would be the same as described for Alternative 4; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of these species if the pump is located adjacent to breeding locations. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Loggerhead Shrike. Construction impacts on loggerhead shrikes would be the same as described for Alternative 1; however, impacts on potential breeding habitat would be reduced because construction of the upstream diversion structure, sedimentation basin, and conveyance pipelines would not occur. A sedimentation basin would still be built but adjacent to the ponds in an area less likely to have potential breeding habitat for this species. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Operation and maintenance impacts on loggerhead shrike would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of the species if the pump is located adjacent to breeding habitat. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

Impact BIO-1b: Project construction and operation would have minor effects on habitat for desert pupfish and several special-status species (less-than-significant impact).

Desert Pupfish. Effects of mosquito control activities would be less than significant as described for Alternative 1.

California Black Rail and Yuma Clapper Rail. The low lift pump diversion at the SCH ponds would be at least 750 feet away from suitable habitat within Sonny Bono NWR and noise levels greater than 60 dBA Leq would not be expected at those habitats. Impacts would be less than significant.

Other Nesting Marsh Birds. Operation and maintenance of the diversion pump station would have less-than-significant impacts on marsh bird nesting due to the distance of nesting habitat from this facility.

Mountain Plover, Lesser Sandhill Crane, Greater Sandhill Crane, American Peregrine Falcon, Bald Eagle, Wood Stork, Large-Billed Savannah Sparrow, Western Yellow Bat, and American Badger. Impacts on these species would be the same as described for Alternative 4; impacts would be less than significant.

Impact BIO-1c: Project operation would provide habitat for desert pupfish and several special-status bird species (beneficial impact). The SCH ponds would provide the same beneficial effects for desert pupfish and special-status bird species as described for Alternative 1, but the area of the ponds would be slightly less (190 acres) at approximately 2,940 acres.

Impact BIO-2: Project construction and operation would cause a temporary disturbance or loss of riparian habitat and/or sensitive habitat (significant impact). Potential losses of riparian habitat under Alternative 6 would be slightly less than for Alternative 1 (up to about 70 acres) due to relatively minor deviations in the amount of shoreline scrub habitat that would be removed.

No impacts on mesquite bosque would occur, because it is not present within the Project footprint.

Impacts on riparian vegetation would be about the same as for Alternative 1 and would be considered a significant impact when compared to the existing environmental setting and the No Action Alternative. MM BIO-5 would apply to Alternative 6 and would reduce impacts to less than significant.

Impact BIO-3a: Project construction would result in temporary disturbance of Federal Waters of the U.S. and minimal effects on wetlands (less-than-significant impact). Temporary disturbance of Waters of the U.S. under Alternative 6 would be slightly less (5 acres) than under Alternative 1 (approximately 1,330 acres) because the aerial extent of the Sea that would be displaced by the ponds is less. As discussed under Alternative 1, although construction of berms and other facilities would result in small losses of Waters of the U.S. (approximately 16 acres), but the Project would have a net increase of 1,360 acres (see Impact BIO-3b). Similar to Alternative 1, operation and maintenance of the ponds and associated facilities would cause temporary disturbances to Waters of the U.S. at intervals during the Project life.

Effects on wetlands would be approximately the same as for Alternative 1. Impacts on wetlands and other Waters of the U.S. would be less than significant.

Implementation of MM BIO-4 would avoid the less-than-significant impacts of the interception ditch on adjacent wetlands.

Impact BIO-3b: Project operation would increase the amount of Federal Waters of the U.S. (beneficial impact). Compared to existing conditions, Alternative 6 would result in a net increase in the extent of Waters of the U.S. of about 1,360 acres, less than for Alternative 1. With the Sea's anticipated receding shoreline under the No Action Alternative, the amount would increase up to the entire pond area (minus berms and islands). As for Alternative 1, the Project is anticipated to also improve the quality of Waters of the U.S. within the area occupied by the SCH ponds compared to existing environmental conditions and the No Action Alternative, and overall impacts would be beneficial.

Impact BIO-4: Project construction and operation would not interfere with movement of fish and wildlife species, but construction could remove snags for colonial nesting birds (less-than-significant impact). The impact analysis for aquatic species in Alternative 1 would apply to Alternative 6, but the effects would be adjacent to or in the Alamo River, and impacts would be less than significant.

Impacts on colonial nesting birds would be the same as described for Alternative 1, including impacts on riparian vegetation.

Implementation of MM BIO-5 would further reduce these less-than-significant impacts.

Impact BIO-5a: Project construction and operation could affect nesting by some common bird species and introduction of invasive species (significant impact). Construction impacts on nesting by common bird species would be the same as described for Alternative 1. However, fewer drains within which common bird species could nest would be combined, which could result in fewer impacts than for Alternative 1. As described in Alternative 2, the potential for impacts on common bird nesting habitats would be reduced because no upstream diversion structure, conveyance pipelines, and sedimentation basins would be built, and the sedimentation basin adjacent to the ponds would be in an area with less potential nesting habitat. MM BIO-2 would apply to Alternative 6 and would reduce impacts to less than significant.

Operation and maintenance impacts on nesting by common bird species would be the same as described for Alternative 1; however, the low lift pump diversion at the SCH ponds may have noise levels greater than 60 dBA Leq and could disrupt breeding of common bird species. MM BIO-2 and MM BIO-3 would apply to Alternative 6 and would reduce impacts to less than significant.

The potential for introduction of invasive species would be the same as described for Alternative 1. MM BIO-6 would apply to Alternative 6 and would reduce impacts to less than significant.

Impact BIO-5b: Project construction and operation would have minor effects on common, fish (native and nonnative), wildlife species, and native plant communities (less-than-significant impact). The analysis described for native plant communities in Alternative 4 would apply to Alternative 6, and impacts would be less than significant.

Effects of diversion entrainment, reduced river flow downstream of the diversion, and water quality fluctuations in the SCH ponds on aquatic biota would be the same as described under Alternative 1, except that the effects would be at the Alamo River, and impacts would be less than significant. Operation of the pump stations and sedimentation basin would have effects similar to those described for Alternative 1, except the sedimentation basin would be 50 acres (10 less than for Alternative 1).

Effects of avian diseases on common bird species would be essentially the same as described for Alternative 1. Effects of selenium uptake would be the same as described for Alternative 4, while effects of pesticides would be essentially the same as described for Alternative 5. Impacts would be less than significant. Project effects on shallow shoreline habitat and common terrestrial wildlife would be less than significant as described for Alternative 1.

Impact BIO-5c: Project construction would benefit common fish (native and nonnative) and wildlife species (beneficial impact). The beneficial effects of the ponds for aquatic species would be the same as described for Alternative 1 but near the Alamo River, and slightly less pond habitat (approximately 190 acres) would be present.

3.4.5 References

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3.5 CULTURAL RESOURCES

3.5.1 Introduction

This analysis addresses the potential for the Species Conservation Habitat (SCH) Project to affect known cultural resources and also the potential to inadvertently uncover cultural resources during Project implementation. "Cultural resources" is a term used to describe prehistoric and historical archaeological sites; architecturally significant properties, such as buildings, bridges, and infrastructure; and resources of importance to Native Americans.

The study area for cultural resources (i.e., the Area of Potential Effects) includes all places where Project-related construction and operations activities would occur, particularly ground-disturbing Project activities. For the SCH Project, the study area/Area of Potential Effects is the same for both United States Army Corps of Engineers (Corps) and the California Natural Resources Agency. Most of the Project would be located within Corp's jurisdictional waters, but no aspects of the Project, including those located in upland areas, would be implemented in the absence of a Corps permit. Therefore, the entire Project area is within the scope of the Corps' analysis. The most sensitive areas for cultural resources are near current and historic watercourses and the current and historic shoreline.

Table 3.5-1 summarizes the impacts of the six Project alternatives on cultural resources, compared to both the existing conditions and the No Action Alternative.

Table 3.5-1 Summary of Impacts on Cultural Resources

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact CR-1: Ground-disturbing activities could change the significance of historical resources, damage unique archaeological resources, disturb human remains, eliminate important examples of the major periods of California history or prehistory, and adversely affect historic properties.	Existing Condition	S	S	S	S	S	S	MM CR-1: Prepare and implement a survey plan and an inadvertent discovery plan
	No Action	S	S	S	S	S	S	Same as Existing Condition

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.5.2 Regulatory Requirements

3.5.2.1 Federal Requirements

National Historic Preservation Act

NHPA section 106 presents regulations regarding the identification and protection of cultural resources. Section 106 requires that Federal agencies take into account the effects of their undertakings on historic properties and afford the State Historic Preservation Officer, and, if appropriate, the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. Federal undertakings include Federal projects, permits, grants, and loans. The purpose of section 106 is to avoid unnecessary impacts on historic properties from Federal undertakings. The section 106 process is

described in the ACHP regulations (36 CFR part 800, as amended August 5, 2004) and Corps regulations at 33 CFR part 325, Appendix C.

Historic properties include districts, archaeological sites, buildings, structures, or objects included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) (36 CFR sections 60.4, 60.6; 40 CFR section 1508.27, subdivision (b)(8)). The NRHP is an inventory of historic resources in the United States maintained by the Secretary of the Interior. Section 106 applies to all properties already listed on the NRHP, formally determined to be eligible for listing, and not formally determined to be eligible but that meet specific eligibility criteria.

The following criteria are used to evaluate properties for the NHPA (36 CFR section 60.4):

> The quality of significance in American history, architecture, archaeology, culture, and engineering is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:
>
> (a) Are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) Are associated with the lives of persons significant in our past; or
>
> (c) Embody the distinct characteristics of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) Have yielded, or may be likely to yield, information important in prehistory or history.

The types of cultural resources that may be determined eligible for inclusion on the NRHP include prehistoric or historic sites, buildings/structures, objects, Traditional Cultural Properties (TCP), and/or ethnographic landscapes. Guidance for determining the eligibility of prehistoric or historic sites, buildings/structures, or objects for inclusion on the NRHP is presented in National Register Bulletin 15 (2002). The TCP concept is presented in National Register Bulletin 38 (Parker and King 1998). A TCP is defined as property eligible for inclusion on the NRHP because of its association with cultural practices or beliefs of a living community that (a) are noted in that community's history and (b) are important in maintaining the continuity of the community (Parker and King 1998:1).

A cultural landscape is a geographic area, including both cultural and natural resources, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values (Birnbaum 1994). One of the types of cultural landscapes is an ethnographic landscape, which Birnbaum (1996:5) describes as "a landscape containing a variety of natural and cultural resources that associated people define as heritage resources." Examples are contemporary settlements, sacred religious sites, and massive geological features. Small plant communities, animals, subsistence, and ceremonial grounds are often components.

The evidence of human activity associated with cultural landscapes is examined through 11 landscape characteristics, which are land uses and activities, patterns of spatial organization, responses to the natural environment, cultural traditions, circulation networks, boundary demarcations, vegetation related to land use, buildings/structures/objects, clusters, archaeological sites, and small-scale elements.

The section 106 review process generally involves the following steps:

- **Step 1: Identify and Evaluate Historic Properties.** The Federal agency identifies and evaluates historic properties that could be affected by the Federal undertaking. Information is developed by literature review, consultation with the California State Historic Preservation Officer (SHPO), and field investigations (as necessary). The eligibility of potentially affected properties for inclusion on the NRHP is assessed.
- **Step 2: Assess Effects.** The effects of the undertaking are evaluated, resulting in a determination of either "no effect," "no adverse effect," or "adverse effect." The SHPO is then consulted.
- **Step 3: Consultation.** If an adverse effect could occur, the SHPO is consulted in order to identify methods to reduce the impacts. Other entities may be consulted, including Native Americans, the public, local government, and the ACHP. Consultation results in the development of a Memorandum of Agreement (MOA) or Programmatic Agreement (PA) that describes agreed upon measures to mitigate adverse effects.
- **Step 4: Filing MOA or PA with ACHP.** Upon execution of the MOA or PA, the agreement is filed with the ACHP if the ACHP did not participate in developing the MOA or PA.
- **Step 5: Proceed with Undertaking.** The Federal agency proceeds with its undertaking under the terms of the MOA or PA.

Archeological and Historic Preservation Act of 1974 (16 USC 469-469c-1)

If a project will affect historic properties that have archeological value, the Archeological and Historic Preservation Act may impose requirements on an agency to protect historic properties. The purpose of this act is “to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance.” However, the Act also addresses activities conducted under Federal permits including any alteration of the terrain.

3.5.2.2 State Requirements

California Environmental Quality Act

Under CEQA, public agencies must consider the effects of their actions on both “historical resources” and “unique archaeological resources.” Pursuant to Public Resources Code (PRC) section 21084.1, a “project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment.” Section 21083.2 requires agencies to determine whether proposed projects would have effects on “unique archaeological resources.”

“Historical resource” is a term with a defined statutory meaning (PRC section 21084.1 and CEQA Guidelines section 15064.5 [a], [b]). The term embraces any resource listed in or determined to be eligible for listing on the CRHR. The CRHR includes resources listed on or formally determined eligible for listing on the NRHP, as well as some California State Landmarks and Points of Historical Interest.

Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be “historical resources” for purposes of CEQA unless a preponderance of evidence indicates otherwise (PRC section 5024.1 and California Code of Regulations (CCR) Title 14 section 4850). Unless a resource listed in a survey has been demolished, lost substantial integrity, or a preponderance of evidence indicates that it is otherwise not eligible for listing, a lead agency should consider the resource to be potentially eligible for list on the CRHR.

In addition to assessing whether historical resources potentially impacted by a proposed project are listed or have been identified in a survey process (PRC 5024.1 [g]), lead agencies have a responsibility to

evaluate them against the CRHR criteria prior to making a finding as to a proposed project's impacts to historical resources (PRC section 21084.1 and CEQA Guidelines section 15064.5 [a][3]). Following CEQA Guidelines section 21084.5, (a) and (b) a historical resource is defined as any object, building, structure, site, area, place, record, or manuscript that:

> Is historically or archeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political or cultural annals of California; and
>
> Meets any of the following criteria:
>
> Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
>
> Is associated with the lives of persons important in our past;
>
> Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
>
> Has yielded, or may be likely to yield, information important in prehistory or history.

Archaeological resources may also qualify as "historical resources," and PRC 5024 requires consultation with the Office of Historic Preservation when a project may impact historical resources located on state-owned land.

For historic structures, CEQA Guidelines section 15064.5, subdivision (b)(3), indicates that a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings, or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995) shall mitigate impacts to a less-than-significant level. Potential eligibility also rests upon the integrity of the resource. Integrity is defined as the retention of the resource's physical identity that existed during its period of significance. Integrity is determined through considering the setting, design, workmanship, materials, location, feeling, and association of the resource.

As noted above, CEQA also requires lead agencies to consider whether projects will impact "unique archaeological resources." PRC section 21083.2, subdivision (g), states that "unique archaeological resources" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

> Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information;
>
> Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
>
> Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Treatment options under section 21083.2 include activities that preserve such resources in place in an undisturbed state. Other acceptable methods of mitigation under section 21083.2 include excavation and curation or study in place without excavation and curation (if the study finds that the artifacts would not meet one or more of the criteria for defining a "unique archaeological resource").

Advice on procedures to identify cultural resources, evaluate their importance, and estimate potential effects is given in several agency publications such as the series produced by the Governor's Office of Planning and Research. The technical advice series produced by this office strongly recommends that Native American concerns and the concerns of other interested persons and corporate entities including, but not limited to, museums, historical commissions, associations and societies, be solicited as part of the process of cultural resources inventory. In addition, California law protects Native American burials, skeletal remains, and associated grave goods regardless of their antiquity and provides for the sensitive treatment and disposition of those remains.

California Health and Safety Code section 7050.5(b) specifies protocol when human remains are discovered. The code states:

> In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in section 5097.98 of the Public Resources Code.

In addition, California Health and Safety Code section 8010-8011 established the California Native American Graves Protection and Repatriation Act. The state repatriation policy is consistent with and facilitates NAGPRA implementation. The act strives to ensure that all California Indian human remains and cultural items are treated with dignity and respect by encouraging voluntary disclosure and return of remains and cultural items by publicly funded agencies and museums in California. The act also provides a mechanism for aiding California Indian tribes, including non-Federally recognized tribes, in filing repatriation claims and obtaining responses to those claims.

CEQA Guidelines section 15064.5, subdivision (e), requires that excavation activities be stopped whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission (NAHC) must be contacted within 24 hours. At that time, the lead agency must consult with the appropriate Native Americans, if any, as identified by the NAHC. Section 15064.5 directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

In addition to the mitigation provisions pertaining to the accidental discovery of human remains, the CEQA Guidelines also require that a lead agency make provisions for the accidental discovery of historical or archaeological resources, generally. Pursuant to section 15064.5, subdivision (f), these provisions should include "an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be a historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be

available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place."

3.5.3 Affected Environment

3.5.3.1 Prehistoric

The prehistory of the Southern California deserts spans at least the last 12,000 years and is usually characterized by four cultural and temporal periods. The prehistory of the Southern California deserts and the surrounding areas are discussed in detail by Wallace et al. (1962), Warren (1967), Bettinger and Taylor (1974), and Warren and Crabtree (1986). The work of these researchers is synthesized in the following discussion of regional archaeological cultures and chronologies.

The Paleoindian period (12,000–7,500 Before Present [BP]) represents the first documented Native American occupation of the region. This time period is highlighted by a transition from cool and moist conditions of the Late Pleistocene to the arid and hot conditions of the Early Holocene. Three distinct cultural complexes are associated with this time period: fluted point complexes, the Lake Mojave Complex, and the San Dieguito Complex. Fluted point complexes have been identified in Southern California deserts, but are primarily found in surface contexts that do not facilitate the recovery of data necessary to fully understand the culture and behaviors of the groups responsible for the manufacture of the fluted points. More data are available for the Lake Mojave and San Dieguito complexes. These two complexes are more common in the Project area than fluted point complexes and also share several key artifact types. Artifacts usually associated with these two complexes include crescents, scrapers, and large bifaces. The Lake Mojave complex is centered in the southwestern Great Basin, while the San Dieguito complex extends from coastal California to the Colorado Desert. San Dieguito sites in the Colorado Desert typically include cleared circles, rock rings, other rock features, and heavily varnished crude stone tools.

The Early Archaic Period (7,500–4,000 BP) was very hot and dry and is poorly represented in the Colorado Desert. Although reasons are not fully understood, it has been suggested that seasonal river flooding may have affected the numbers of sites dating to this time period. Regardless, neighboring regions provide data regarding the Archaic Period. In these areas, the Early Archaic Period is generally characterized by a diversification of artifact assemblages, including the introduction of groundstone technologies for seed processing. It is likely that these trends also occurred in the Lower Colorado Desert. Pinto, Gypsum, Silver Lake, and possibly concave base projectile points are associated with the Early Archaic Period.

The Middle Archaic Period (4,000–1,500 BP) is also poorly represented in the Colorado Desert. Climatic conditions became cooler and moister, and seed collecting and processing characterize economic pursuits during this time period. Artifacts typically associated with the Middle Archaic include manos, metates, handstones, and the bow and arrow, which appear in artifact assemblages towards the end of the time period.

The Late Archaic (1,500–450 BP) is characterized by Native American populations expanding their territories. During this time period, changes in the flow of the Colorado River into Lake Cahuilla expanded it and created a series of freshwater lakes around it. These changes facilitated the development of agriculture and semipermanent villages along the Lower Colorado River. At the same time as the development of agriculture, extensive trade networks were established to connect agricultural settlements in the greater Southwest with the Gulf of California and the Pacific Ocean.

Following the Late Archaic Period, Euroamerican exploration and contact with local Native Americans gradually increased across the region. Euroamerican activity in the area, as in other parts of California,

negatively affected Native American populations and culture. Euroamericans introduced new diseases, claimed Native American tribal territories for their uses, and relocated Native American groups to missions or areas beyond their traditional territories. These circumstances disrupted the cultural patterns of Native American groups and contributed to the decline of Native Americans and their cultures.

3.5.3.2 Ethnography

The territories of two Native American groups, Kumeyaay and Cahuilla, encompass the Salton Sea. Cahuilla territory primarily encompasses the northern half of the Salton Sea and Kumeyaay territory primarily encompasses the southern half of the Salton Sea. Consequently, the Project would be primarily in Kumeyaay territory, but is near Cahuilla territory. Indeed, the Torres Martinez Desert Cahuilla Indians currently occupy the Torres Martinez Indian Reservation, which is located at the northern end of the Salton Sea.

Kumeyaay

Kumeyaay inhabit the area currently encompassed by Imperial County, and comprise groups formerly identified as Tipai and Ipai (Carrico 1983; Cline 1979; Hedges 1975; Luomala 1978; Shipek 1991). Kumeyaay territory extends east nearly to Yuma, Arizona, southwest to Todos Santos Bay, west to the Pacific Ocean, and northwest to the San Luis Rey River and San Felipe Creek. Quechan and Cahuilla border Kumeyaay territory to the east and north, respectively.

The Kumeyaay language, formerly called Diegueño, is part of the Hokan stock of the Yuman language family (Langdon 1990). Kumeyaay were organized into autonomous tribelets under the control of a chief (kwaaypaay) who had at least one assistant (Luomala 1978; Shipek, 1991). The position of chief was inherited from father to eldest son. The chief directed ceremonies and resolved differences within the group. Kroeber (1925:712) suggests that Tipai and Ipai populations numbered approximately 3,000 at the time of contact, circa 1770–1790. Subsequent to contact, the Native American population decreased, and in 1821 Mission San Diego records document a population of 1,711, which would have included Kumeyaay (Luomala 1978).

Kumeyaay relied heavily on seasonally available vegetal foods on valley floors and in the foothills and mountains. In the spring, blossoms and buds were collected from blooming plants in the foothills. During the summer, cactus fruits, agave, and mesquite pods were collected in valleys. Small animals were hunted during both seasons. During the fall and winter months, Kumeyaay moved into the mountains seeking shelter and food. Rockshelters and overhangs provided shelter from winter rain and snow, and acorns, piñon nuts, and small game provided food.

Kumeyaay material culture includes seed-processing implements, such as the mortar and pestle and milling stones; baskets that were used for seed winnowing and storage; plain and decorated reddish-brown ceramic vessels that were used for both cooking and storing water; and the bow and arrow. Structures built by the Kumeyaay varied in form depending on the season. For example, summer residential structures often consisted only of a windbreak, while winter residential structures were semi-subterranean pit houses with a tie pole framework and brush thatch. Kumeyaay also built ceremonial structures, such as rock-supported brush fence circles, for events such as harvest dances (Luomala 1978; Shipek 1991).

Kumeyaay primarily interacted and traded among themselves, but did involve neighboring groups in certain trading activities. For example, coastal groups traded salt, dried seafood, and abalone shells with interior valley groups for gourds, acorns, agave, and mesquite pods. Kumeyaay also traded for granite to manufacture mortar and pestles, and Quechans traded with the Kumeyaay for acorns and acorn flour (Luomala 1978; Shipek 1991).

Cahuilla

Cahuilla territory encompasses an area from the summit of the San Bernardino Mountains in the north to Salton Sea and the Chocolate Mountains in the south that is bordered on the east by Orocopia Mountain and the west by Palomar Mountain (Bean 1978). The Cahuilla language belongs to the Cupan subgroup of the Takic family that is part of Uto-Aztecan stock (Bean 1978). Three major groups of Cahuilla, corresponding to geographic locations, have been identified within Cahuilla territory: Desert Cahuilla, Mountain Cahuilla, and Western or Pass Cahuilla (Kroeber 1925). Ethnographic sources documenting Cahuilla culture include Barrows (1900), Hooper (1920), Strong (1929), Kroeber (1925), H.C. James (1960), Bean (1964, 1972), and Bean and Lawton (1965).

Cahuilla lived in semipermanent villages generally located within canyons or on alluvial fans near water sources such as creeks or springs. Cahuilla were organized into clans and lineages that interacted for defense, communal subsistence activities, and rituals (Bean 1978). Lineage leadership was hereditary, being passed from father to son. In addition to lineage chiefs, shamans were also important and powerful individuals in Cahuilla society because of their ability to communicate with and influence the actions of supernatural forces. Each lineage owned a village, the territory immediately surrounding it, and specific resources. Regardless, most lineage territory was open to all Cahuillas. Cahuilla also established seasonal campsites across their territory to exploit seasonally available plant and animal resources (Bean 1978). Cahuilla constructed either dome-shaped or rectangular houses, with the size of the residence reflecting the needs of the family occupying it. Other typical structures built by Cahuilla include chief's houses, ceremonial houses, men's sweathouses, and acorn granaries.

Cahuilla exploited a wide variety of resources, including acorns, honey mesquite, screw beans, piñon nuts, cactus fruit, berries, tubers, roots, deer, rabbit, antelope, bighorn sheep, reptiles, quails, and ducks (Kroeber 1925; Bean 1978). Animals were hunted by individuals and also by the use of communal drives. Hunting implements included mesquite or willow bows and arrows, throwing sticks, and traps. Other material culture used by the Cahuilla includes baskets, coiled pottery, manos and metates, mortars and pestles, charm stones, and bull-roarers (Kroeber 1925; Bean 1978).

Disputes between Cahuilla and their neighbors were generally infrequent and related to access to or control over economic resources. Cahuilla usually interacted with their neighbors, particularly the Luiseño and Serrano, as trading partners. The Cocopa-Maricopa Trail, a prehistoric trade route, passes through the area, and some Cahuilla specialized as traders traveling as far as Santa Catalina in the west and the Gila River in the east (Bean 1978). Marine shell beads were used as a medium of exchange across Cahuilla territory and facilitated the acquisition of a variety of items across a wide area.

3.5.3.3 History

Spanish exploration of Southern California dates to the 1500s. Hernando de Alarcon discovered Alta California while sailing up the Colorado River in 1540 and was the first European to encounter the Quechan Indians (Hoover et al. 1990). The impact of 16th century exploration on the native peoples in the area, however, appears to have been relatively minimal. Spanish exploration of the area continued into the 18th century, and in 1775 Juan Batista de Anza volunteered to find an overland trail to connect Spanish settlements in Sonora, Mexico, with new missions on the California Coast (Beck and Haase 1974; Hoover et al. 1990). The trail opened by Anza was also used by later explorers, trappers, and argonauts. Subsequent to Anza's explorations, the Spanish attempted to establish missions in the area, but were generally unsuccessful. Two missions were built in 1780, but were destroyed a year later by hostile Yuma Indians dissatisfied with their treatment by the Spanish.

The Anza Trail across what is now Imperial County later became known as the Sonora Road, the Colorado Road, the Emigrant Trail, and the Butterfield Stage Route (Hoover et al. 1990). The Sonora

Road/Emigrant Trail was used from 1825 to 1865 for cattle drives from New Mexico and Texas to ranches in the Coastal Range (County of Imperial 1993). The Butterfield Stage also used this route until completion of the railroad across the region in 1878 (Zimmerman 1981).

Euroamerican contact with Native Americans increased across the area of the Southern California deserts in 1848 and 1849 as gold miners passed through the area along the Emigrant Trail. Indeed, construction of Yuma Crossing and the military fortification of Fort Yuma in 1852 were due to numerous hostile confrontations between Euroamericans and Native Americans in the area. Imperial Valley, however, did not attract many settlers until its agricultural potential was developed in the early 1900s. Irrigation of the valley was first suggested by Oliver Wozencraft and eventually accomplished by Charles R. Rockwood and George Chaffey in 1901 (Hoover et al. 1990). The introduction of irrigation in Imperial Valley spawned the development of both large- and small-scale agriculture and the establishment of many small towns. The area grew rapidly, and by 1907 nearly 15,000 people lived in Imperial Valley. Southern Pacific Railroad also built a branch line in the area in 1903 to handle the increased commercial export of agricultural products (Zimmerman 1981). At this time, Imperial Valley was officially incorporated as a jurisdiction separate from San Diego County.

Between 1905 and 1907, Imperial Valley was accidentally flooded due to a faulty canal gate. As a result, the Salton Basin was inundated and the Salton Sea was created. Subsequently, major improvements were made to the irrigation system to prevent future flooding. Imperial Irrigation District took control of the irrigation system in 1916, and by 1941 a more reliable and consistent water supply was assured for the area with the completion of the All American Canal. Currently, the All American Canal is a Reclamation facility for which the Imperial Irrigation District has operations and maintenance responsibility. Although agriculture still continues to be the predominant activity in Imperial Valley, other major industries are now becoming part of a wider economic base that includes geothermal energy development, mining, customs brokers, tourism, and the provision of essential regional and national facilities, such as correctional institutions and military training facilities (Zimmerman 1981).

3.5.3.4 Known Cultural Resources in the Study Area

The areas where ground disturbance could occur under each of the six Project alternatives is shown in Figure 2-2, which also shows land that is managed by the United States Fish and Wildlife Service as part of the Sonny Bono Salton Sea National Wildlife Refuge. A sacred lands search from the NAHC (2010) did not identify any sensitive Native American cultural resources in the study area. A records search from the South Coastal Information Center of the California Historic Records Information System showed that part of the study area was previously surveyed and that two prehistoric sites and seven historic sites are in or immediately adjacent to the area. Table 3.5.2 identifies the types of sites that were found; as indicated, their eligibility for inclusion on the NRHP and/or the CRHR has not yet been determined.

Table 3.5-2 Known Cultural Resources in the Study Area

Site Identification Number	Site Type	NRHP/CRHR Eligibility
P-13-008176	Prehistoric	Not Determined
CA-IMP-902	Prehistoric Trail	Not Determined
CA-IMP-3251-H	Historic/Geologic	Not Determined
CA-IMP-3254-H	Historic/Geologic	Not Determined
CA-IMP-3256-H	Historic/Geologic	Not Determined
CA-IMP-3257-H	Historic/Geologic	Not Determined
CA-IMP-3258-H	Historic/Geologic	Not Determined

Table 3.5-2 Known Cultural Resources in the Study Area

Site Identification Number	Site Type	NRHP/CRHR Eligibility
CA-IMP-3284-H	Historic Wagon Track	Not Determined
CA-IMP-8395	Historic Well	Not Determined

3.5.4 Impacts and Mitigation Measures

3.5.4.1 Impact Analysis Methodology

Impacts on cultural resources were analyzed through consideration of the proximity of ground-disturbing Project activities to known cultural resources, as well as the potential for impacts on undiscovered resources given the sensitivity of the study area.

3.5.4.2 Thresholds of Significance

Significance Criteria

The significance criteria listed below are derived from the State CEQA Guidelines section 15064.5 and Appendix G, as well as the criteria of adverse effects listed by 36 CFR section 800.5. The criteria were used by the California Natural Resources Agency and the Corps to determine the significance of the impacts of the Project alternatives on historical resources/historic properties, although significance conclusions are not expressly required under NEPA. The Corps has agreed to use the CEQA criteria presented below for purposes of this EIS/EIR. The Corps also has applied additional Federal NHPA requirements as appropriate in this EIS/EIR.

Impacts would be significant if implementation of the Project would:

1. Cause a substantial adverse change in the significance of a historical resource as those terms are defined in State CEQA Guidelines section 15064.5.

2. Cause damage to a unique archaeological resource pursuant to State CEQA Guidelines section 15064.5 and PRC section 21083.2, subdivision (g).

3. Disturb any human remains, including those interred outside formal cemeteries.

4. Have the potential to eliminate important examples of the major periods of California history or prehistory.

In addition to the above CEQA requirements, the Corps must comply with NHPA section 106 and assess impacts on historic properties based on its definition of adverse effect. Under the NHPA and NEPA, cultural impacts would be significant if the Project would adversely affect a historic property by altering the characteristics that qualify the property for inclusion on the NRHP in a manner that would diminish the integrity of the property (36 CFR section 800.5; 40 CFR section 1508.27, subdivision (b)). Therefore, impacts would also be considered significant if implementation of the Project would:

5. Adversely affect a historic property by altering the characteristics that qualify the property for inclusion on the NRHP in a manner that would diminish the integrity of the property.

Integrity is the ability of a property to convey its significance, based on its location, design, setting, materials, workmanship, feeling, and association. Adverse effects can be direct or indirect. They include

reasonably foreseeable impacts that may occur later in time, be farther removed in distance, or be cumulative ((36 CFR section 800.5).

Application of Significance Criteria

A summary of the overall methodology used in applying the significance criteria to the Project alternatives follows.

- **Change the significance of a historical resource, damage a unique archaeological resource, disturb any human remains, eliminate important examples of the major periods of California history or prehistory, or adversely affect a historic property** – Construction activities would have the potential to affect both known and undiscovered cultural resources both in upland areas and those that are currently submerged and cause effects listed under each of the significance criteria.

3.5.4.3 No Action Alternative

A potential exists for significant unknown archaeological and historical materials, including human remains, to be present under the currently submerged areas of the Salton Sea. The reduction in water surface elevation that would occur over time could expose these resources, which would then be subject to wave- and/or wind-induced erosion. The potential for the unauthorized collection of artifacts also would increase. Ground-disturbing activities associated with the construction of facilities such as desert pupfish channels and the relocation of recreational facilities as the Salton Sea recedes also has the potential to affect cultural resources in the general Project area.

3.5.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact CR-1: Ground-disturbing activities could change the significance of historical resources, damage unique archaeological resources, disturb human remains, eliminate important examples of the major periods of California history or prehistory, and adversely affect historic properties (significant impact). None of the proposed activities under Alternative 1 would be located in the vicinity of known cultural resources. Therefore, no direct impacts on known cultural resources would occur as a result of construction of this alternative. The Project would be located in an archaeologically sensitive area, however, and construction activities could encounter cultural resources or human remains associated with the area's historical occupation by both Native Americans and Euroamericans. Such impacts on those resources could be significant under significance criteria 1, 2, 3, 4, and/or 5.

Mitigation Measures

MM CR-1: Prepare and implement a survey plan and an inadvertent discovery plan. A plan for the survey of Project areas not previously surveyed would be prepared to facilitate identification of cultural resources prior to initiation of ground-disturbing activities. A plan for the inadvertent discovery of cultural resources and human remains also would be prepared and would provide protocols for addressing the discovery of cultural resources and human remains including, but not limited to, monitoring; immediately halting all construction in the vicinity of a discovery; investigation of the discovery by an archaeologist that meets the Secretary of the Interior's Standards and Guidelines for Professional Qualifications in order to evaluate the eligibility of the resources pursuant to CRHR and NRHP criteria; and implementation of California Health and Safety Code section 7050.5, CCR section 15064.5(d) and (e), and, if applicable, 36 CFR part 800.13. Resources considered significant would be avoided or subject to a data recovery program. The data recovery program would be designed in consultation with appropriate state (i.e., Office of Historic Preservation) and Federal agencies and include excavation of an archaeological site to recover any buried artifacts or other data.

Residual Impact

Implementation of MM CR-1 would reduce potential impacts on unknown cultural resources and inadvertently discovered human remains to a less-than-significant level because significant resources would be identified and either avoided or subject to a data recovery program that complies with regulatory agency requirements.

3.5.4.5 Alternative 2 – New River, Pumped Diversion

Impact CR-1: Ground-disturbing activities could change the significance of historical resources, damage unique archaeological resources, disturb human remains, eliminate important examples of the major periods of California history or prehistory, and adversely affect historic properties (significant impact). The discussion under Alternative 1 is applicable to this alternative. MM CR-1 also is applicable to this alternative and would reduce this impact to less than significant.

3.5.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact CR-1: Ground-disturbing activities could change the significance of historical resources, damage unique archaeological resources, disturb human remains, eliminate important examples of the major periods of California history or prehistory, and adversely affect historic properties (significant impact). The discussion under Alternative 1 is applicable to this alternative. MM CR-1 also is applicable to this alternative and would reduce this impact to less than significant.

3.5.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact CR-1: Ground-disturbing activities could change the significance of historical resources, damage unique archaeological resources, disturb human remains, eliminate important examples of the major periods of California history or prehistory, and adversely affect historic properties (significant impact). The discussion under Alternative 1 is applicable to this alternative. MM CR-1 also is applicable to this alternative, and would reduce this impact to less than significant.

3.5.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact CR-1: Ground-disturbing activities could change the significance of historical resources, damage unique archaeological resources, disturb human remains, eliminate important examples of the major periods of California history or prehistory, and adversely affect historic properties (significant impact). The discussion under Alternative 1 is applicable to this alternative. MM CR-1 also is applicable to this alternative and would reduce this impact to less than significant.

3.5.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact CR-1: Ground-disturbing activities could change the significance of historical resources, damage unique archaeological resources, disturb human remains, eliminate important examples of the major periods of California history or prehistory, and adversely affect historic properties (significant impact). The discussion under Alternative 1 is applicable to this alternative. MM CR-1 also is applicable to this alternative and would reduce this impact to less than significant.

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3.6 ENERGY CONSUMPTION

3.6.1 Introduction

This section focuses on the demand for electrical power that would be generated by operation of the Species Conservation Habitat (SCH) Project. Diesel fuel, gasoline, and power used during construction and maintenance activities would be the only other source of substantive energy consumption; the permanent employees would use minor amounts of fuel. The equipment and vehicles used during construction and maintenance would be the minimum needed to perform the required work, and fuel would not be used in a wasteful manner. Therefore, fuel consumption and electrical demand during construction is not addressed in this section. The study area comprises the service area of the Imperial Irrigation District (IID), which would provide electrical power to the SCH Project. Issues associated with Project compatibility with geothermal development are addressed in Section 3.13, Land Use.

Table 3.6-1 summarizes the impacts of the six Project alternatives on energy consumption, compared to both the existing conditions and the No Action Alternative.

Table 3.6-1 Summary of Impacts on Energy Consumption

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact EN-1: Pumping would require power for the duration of the Project.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.6.2 Regulatory Requirements

3.6.2.1 State Regulations

A number of state laws dealing with renewable energy and greenhouse gas (GHG) emissions have affected the way IID chooses to acquire its energy resources, including Senate Bill (SB) 1368, SB 2120, SB 1078, Assembly Bill (AB) 32, and Executive Orders S-14-08 and S-21-09 (IID 2010a).

SB 1368 prohibits any retail seller of electricity in California from entering into a long-term (greater-than-5-year) financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant. This performance standard applies to electricity generated out of state as well as in state, and to publicly owned as well as investor-owned electric utilities.

SB 2120 first established a standard to provide 20 percent of energy from renewable sources by 2010. This target does not directly bind IID, although IID voluntarily agreed to meet this goal in 2007 as a result of rate impact considerations (IID 2010a).

Established in 2002 under SB 1078 and accelerated in 2006 under SB 107, California's Renewables Portfolio Standard requires retail suppliers of electric services to increase procurement from eligible renewable energy resources by at least 1 percent of their retail sales annually, until they reach 20 percent by 2010. IID is required to register all renewable resources that it owns or constructs, track the net output from each of the certified resources, and report it to the Western Region Renewable Electricity Information System established by the California Energy Commission (IID 2010a). For purchase power agreements, the generator owner is required to provide the necessary data to this information system to verify that sales to the IID are certified as renewable resources (IID 2010a).

The California Global Warming Solutions Act of 2006, widely known as AB 32, and Governor Schwarzenegger's Executive Order S-14-08 direct all state entities, including irrigation districts, to achieve at least 33 percent renewable energy by 2020. AB 32 requires the California Air Resources Board to develop and enforce regulations for the reporting and verification of statewide GHG emissions, including establishing a cap and trade emissions control mechanism by 2012.

Since 2006, California has had a mandate to increase the use of renewable generation to 20 percent of retail electricity sales by 2010 (refer to description of SB 1078 and SB 107 above). In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which raises California's renewable energy goals to 33 percent by 2020. This enhanced target is intended to help California meet statewide GHG emission reduction targets, and has been reiterated by California Executive Order S-21-09, which requires California Air Resources Board, by July 31, 2010, to establish a regulation consistent with this 33 percent target by 2020; however, no new renewable energy standard pursuant to S-21-09 has been set to date.

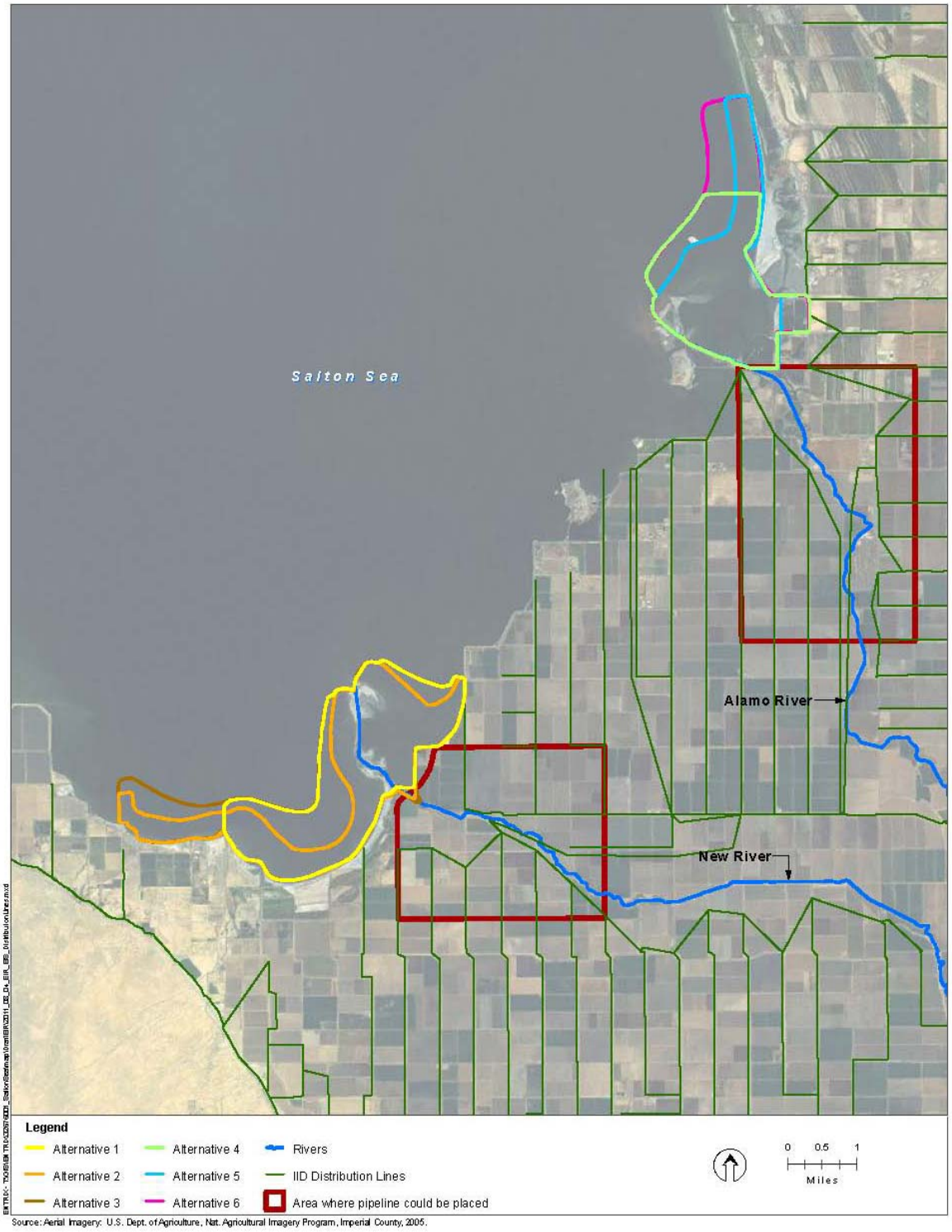
3.6.2.2 Imperial Irrigation District, 2010 Integrated Resources Plan

IID's *2010 Integrated Resources Plan* (IID 2010a) attempts to merge IID's goals and objectives with regulatory requirements that mandate the adoption of new renewable energy portfolio standards, reducing GHG emission, and acquiring cost-effective resources. The plan includes a number of goals, including the following:

- Implement energy efficiency programs necessary to reduce load by at least 5 percent by 2015, with a 10 percent load reduction goal by 2020;
- Meet or exceed all state and Federal planning criteria for renewable resources with a goal of generating 20 percent of energy requirements from renewable sources by 2012, 23 percent by 2014, 26 percent by 2017, and at least 33 percent by 2020; and
- Reduce GHG emissions by at least 35 percent by 2020 in comparison to 2009 levels to minimize the cost of purchasing emission allowance credits in the marketplace.

3.6.3 Affected Environment

IID provides energy on a wholesale and retail basis to more than 145,000 customers in Imperial, Riverside, and San Diego counties (IID 2010b). IID's distribution system in the vicinity of the SCH Project is shown on Figure 3.6-1. IID obtains power from a variety of sources, including hydroelectric plants located on the All American Canal System; the San Juan Unit 3, a coal plant in New Mexico; the Palo Verde Nuclear Generation Station in Arizona; and natural gas and diesel generation within or near the service area boundary. In 2009, the peak demand in the service area was slightly under 1,000 megawatts (MW).



Source: Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.6-1 IID's Power Distribution System near the SCH Project

IID is required to have generation resources providing reserves totaling approximately 15 percent of load. Thus, IID is required to be able to deliver nearly 1,150 MW (for the peak summer months). IID expects to see significant load growth as the California economy begins to recover, and retail energy use is expected to increase as a result. However, IID's energy forecasts still show a small energy increase of around 0.7 percent from 2008 through 2012 (IID 2010a).

IID is proposing a new generation plan, the Base Case Power Supply Plan, to meet renewable portfolio standards and GHG emission reduction requirements for the period 2010 through 2012. The proposed resource plan includes a new 145 MW combined cycle generation facility at the existing El Centro Steam Plant Unit 3 by 2012; entering into a power purchase agreement for 50 MW of geothermal generation for delivery by 2013; entering into a power purchase agreement for 20 MW of solar thermal generation by 2012; and entering into a power purchase agreement for 17 MW of geothermal generation by 2014 with other Southern California Public Power Authority members (IID 2010a).

IID is implementing energy efficiency programs with the goal of reducing peak demand by up to 50 MW within 5 years, including conservation and demand-side management programs. These programs target air conditioning, lighting, and equipment efficiency. Some new programs implemented by IID in 2010 include the Ice Bear Thermal Energy Storage Program, which could reduce peak demand by almost 10 MW, and the Key Customer Demand Response Program, which pays major industrial and commercial customers to curtail their load or operate on-site generators during periods of high demand. IID hopes to acquire 30-40 MW from the Key Customer Demand Response Program in 2010 (IID 2010a).

3.6.4 Impacts and Mitigation Measures

3.6.4.1 Impact Analysis Methodology

Project impacts were assessed by considering whether the energy consumption resulting from the operation of Project alternatives would be wasteful or whether opportunities exist to minimize power demand.

3.6.4.2 Thresholds of Significance

Significance Criteria

Impacts on energy consumption would be significant if the Project alternatives would result in the inefficient, wasteful, or unnecessary consumption of energy.

Application of Significance Criteria

Incidental energy use would be associated with the trailer used by the permanent employees as office space (e.g., for lighting). This minimal electrical demand would not be wasteful and is not considered further. Power demand would result primarily from the operation of electric pumps to deliver water to the Project from the New or Alamo rivers (under Alternatives 2, 3, 5, and 6) and the Salton Sea (all Project alternatives). The river diversion would be located within 100 yards of the SCH delivery point and would be a low-head lift (about 10 feet). The Sea diversion, however, could be up to 2 miles away from the SCH ponds. The lift would initially be low head (10 to 15 feet) but would increase as the Sea recedes. Three-phase power would be extended to the pump locations.

The amount of water supply pumped from each source would vary depending on the desired salinity of the ponds and the length of time the water would remain in the pond (residence time). The energy required to pump from a river would be less than the energy required to pump a similar amount from the Salton Sea because the required head (lift and length of pipeline) would be greater and because the density of saline water would be greater than the water diverted from the rivers. In addition, the seawater

pumps may be subject to fouling from salt that would reduce the pump efficiency over time. The residence time and salinity of the pond water also would change the power requirements. Higher salinity levels and shorter residence would require more power consumption than a longer residence time with lower salinity water.

The total power requirements for the Project alternatives, assuming 4-week and 16-week residence times for different concentrations of salinity are shown in Table 3.6-2.

Table 3.6-2 Power Requirements (in Kilowatt Hours) for Different Residence Times and Salinity Concentrations

4-week Residence Time						
	20 ppt			40 ppt		
Alternative	Seawater	River Water	Total	Seawater	River Water	Total
1	16,517		16,517	60,935		60,935
2	18,067	2,663	20,730	41,971	743	42,714
3	26,142	5,566	31,708	61,733	2,129	63,861
4	14,616		14,616	33,430		33,430
5	8,534	1,636	10,169	20,010	488	20,498
6	32,958	4,103	37,061	39,213	1,076	40,289
16-week Residence Time						
	20 ppt			40 ppt		
Alternative	Seawater	River Water	Total	Seawater	River Water	Total
1	3,185		3,185	22,025		22,025
2	1,608	780	2,388	9,103	210	9,314
3	5,211	1,976	7,187	11,660	360	12,020
4	1,287		1,287	6,972		6,972
5	1,014	516	1,530	4,824	154	4,978
6	2,416	1,076	3,491	15,433	250	15,683

Note: ppt = parts per thousand

Because the SCH is a proof-of-concept project, the testing of different salinity and residence times is an integral part of the Project, and the SCH operation would result in different pumping rates and energy consumption as identified in Table 3.6-2. This use of energy is not considered inherently unnecessary or wasteful.

3.6.4.3 No Action Alternative

As described in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources and California Department of Fish and Game 2007), the No Action Alternative would involve construction and operations and maintenance activities for pupfish channels. Additionally, IID, as mitigation for the IID Water Conservation and Transfer

Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at Salton Sea State Recreation Area, as well as boat launches along the shoreline. Under the No Action Alternative, it is assumed that IID would provide electrical services to facility and construction sites around the shoreline and on the seabed. Overall, electrical consumption is projected to increase steadily in the future. It is anticipated that IID will continue to implement its *Integrated Resources Plan* and energy efficiency planning to meet future demands and requirements for incorporating alternative energy sources into its energy network.

3.6.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The New River diversion would be gravity fed under Alternative 1; thus, pumping from the Salton Sea would constitute the primary long-term energy demand. A seawater pump would be provided from 1 to 2 miles from the existing shore, and a recirculation pump would be located at the intermediate berm separating the independent pond from the cascading pond. The seawater pump would lose efficiency over time because of the hypersaline water being pumped, but would be maintained as appropriate to reduce fouling and would be replaced when needed. The recirculation pump would also recirculate saline water from the ponds to offset some of the Sea's pumping. The recirculation pump would collect water at the cascading pond and introduce it into the saline water line at the head of the system. Thus, the Project would not use energy in an inefficient or wasteful manner. This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

3.6.4.5 Alternative 2 – New River, Pumped Diversion

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). Alternative 2 differs from Alternative 1 in that water would be pumped from the New River as well as from the Salton Sea. The Sea's pumping station would be located 1 to 2 miles from the shore. As discussed above, the efficiency of the saline pump is of more concern than that of the river water pump, but the pump would be maintained appropriately and replaced when needed. Therefore, impacts would be less than significant.

3.6.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The discussions under Alternatives 1 and 2 are applicable to this alternative.

3.6.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Alternative 4 differs from Alternative 1 in that no recirculation pump would be required, and a seawater pump would be provided at Red Hill with a pipeline projecting out into the Sea. This pump would be easier to maintain than one in the Sea because it would be land-based.

3.6.4.8 Alternative 5 –Alamo River, Pumped Diversion

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to Alternative 5.

3.6.4.9 Alternative 6 –Alamo River, Pumped Diversion + Cascading Ponds

Impact EN-1: Pumping would require power for the duration of the Project (less-than-significant impact). The discussions under Alternatives 2 and 4 are applicable to Alternative 6.

3.6.5 References

California Department of Water Resources and California Department of Fish and Game. 2007. Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report.

Imperial Irrigation District (IID). 2010a. 2010 Integrated Resources Plan.

Imperial Irrigation District (IID). 2010b. Energy history. Website (http://www.iid.com/index.aspx?page=263) accessed November 1, 2010.

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3.7 ENVIRONMENTAL JUSTICE

3.7.1 Introduction

This section discusses the potential for each Project alternative to result in disproportionate impacts on minority and/or low-income populations. Primary issues of concern with regard to the Species Conservation Habitat (SCH) Project include the Project's potential effects on local communities from air emissions during construction and the exposure or destruction of cultural resources. This environmental justice analysis assesses the extent that such impacts, should they occur, would disproportionately affect minority and/or low-income populations relative to the general public.

The study area for this analysis is based on the location of the alternatives and the location where the majority of impacts associated with the SCH Project are expected to occur. Thus, the region of influence is defined as communities within a 10-mile radius of the southern Salton Sea in Imperial County, as well as those communities that are located along the shoreline, including the cities of Westmorland, Calipatria, and Brawley, and the unincorporated communities of Niland, Salton City, Desert Shores, and Bombay Beach. The Torres Martinez Desert Cahuilla Indian Reservation, located on the Sea's northern side, also is included in the study area.

Table 3.7-1 summarizes the impacts of the six Project alternatives on environmental justice, compared to both the existing conditions and the No Action Alternative.

Table 3.7-1 Summary of Impacts on Environmental Justice

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact EJ-1: Construction air emissions would have a disproportionate impact on minority and low-income populations.	Existing Condition	U	U	U	U	U	U	MM AQ-1: Implement fugitive PM_{10} control measures. MM AQ-2: Implement diesel control measures.
	No Action	U	U	U	U	U	U	Same as Existing Condition
Impact EJ-2: Ground-disturbing activities could expose and damage undiscovered prehistoric and historic resources and result in the inadvertent discovery of human remains.	Existing Condition	S	S	S	S	S	S	MM CR-1: Prepare and implement a survey plan and an inadvertent discovery plan.
	No Action	S	S	S	S	S	S	Same as Existing Condition

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.7.2 Regulatory Requirements

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) was issued on February 11, 1994. Executive Order 12898 is intended to focus attention on environmental and human health conditions in areas of high minority populations and low-income communities and promote nondiscriminatory programs and projects substantially affecting human health and the environment. This Executive Order requires Federal agencies and state agencies receiving Federal funds to develop strategies to address environmental justice issues. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations.

Federal agencies received a framework for the assessment of environmental justice in the United States Environmental Protection Agency's "Guidance for Incorporating Environmental Justice Concerns" and its corresponding "NEPA Compliance Analysis" in 1998. Minority populations are identified where either:

- The minority population of the affected area is greater than 50 percent of the affected area's general population; or
- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

In 1997, the President's Council on Environmental Quality also issued environmental justice guidance that defines minority and low-income populations as follows:

- Minorities are identified as individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black not of Hispanic origin; or, Hispanic (without double-counting nonwhite Hispanics falling into the Black/African-American, Asian/Pacific Islander, and Native American categories).
- Low-income populations are identified as populations with mean annual incomes that fall below the annual statistical poverty level.

In this section, the definitions of minority and low-income populations are based upon the 1997 Council on Environmental Quality Guidance, and they are considered applicable when a defined area's total population is 50 percent or more minority or low income (in this case, the communities within the study area represent the "defined area" of analysis). The general area is Imperial County.

California law defines environmental justice as "the fair treatment of people of all races, cultures and income with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies" (Government Code section 65040.12 and Public Resources Code section 72000). In conformance with this law, it is the California Natural Resources Agency's policy that the fair treatment of people of all races, cultures, and income be fully considered during the planning, decision making, development, and implementation of all Natural Resources Agency programs, policies, and activities. The intent of this policy is to ensure that the public, including minority and low-income populations, are informed of opportunities to participate in the development and implementation of all Natural Resources Agency programs, policies, and activities, and that they are not discriminated against, treated unfairly, or caused to experience disproportionately high and adverse human health or environmental effects from environmental decisions (California Department of Water Resources [DWR] and California Department of [DFG] 2007).

3.7.3 Affected Environment

Data presented in the following subsections are based upon information from the U.S. Census American FactFinder, which is considered the most comprehensive data currently available for these communities. American Community Survey estimates are used to produce the Fact Sheets and are based on data collected over a 5-year time period. The estimates represent the average characteristics of population and housing between January 2005 and December 2009 and do not represent a single point in time.

3.7.3.1 Population and Ethnicity

Table 3.7-2 provides data on population by race for Imperial County and the cities and communities in the Project vicinity. As shown in this table, minority populations comprise the majority of the population in Imperial County, and persons of Hispanic or Latino origin represent the greatest majority of the minority population. With the exception of Niland, Salton City, and Bombay Beach, the communities within the region of influence are similar in ethnic composition to the total county population, but only Westmorland has a minority population that is greater than that of the county as a whole, and only by a small percentage (its non-Hispanic white population is 15.4 percent, as opposed to 16.7 percent for the entire county). All of the communities, except for these three, have total minority populations greater than 50 percent.

Table 3.7-2 Distribution of Minority Populations in the Vicinity of the Project Area

Ethnicity	Number of People (Percent of Population)							
	Imperial County	Westmor-land	Brawley	Niland	Salton City	Calipatria	Desert Shores	Bombay Beach
White (non-Hispanic)	26,646 (16.7)	249 (15.4)	3,925 (17.5)	438 (33.0)	602 (43.7)	1,415 (18.6)	159 (20.1)	177 (63.0)
Hispanic	121,781 (76.1)	1,331 (82.2)	17,370 (77.4)	859 (64.6)	731 (53.0)	4,538 (59.5)	632 (79.9)	0
Black	5,783 (3.6)	16 (1.0)	766 (3.4)	0	97 (7.0)	1,359 (17.8)	0	94 (33.5)
Native American	2,628 (1.6)	38 (2.3)	120 (0.5)	0	0	106 (1.4)	0	10 (3.6)
Asian	3,334 (2.1)	0	368 (1.6)	32 (2.4)	19 (1.4)	75 (1.0)	0	0
Native Hawaiian/ Pacific Islander	144 (0.1)	0	0	0	0	43 (0.6)	0	0
Some other race	30,164 (18.8)	164 (10.1)	4,253 (19.0)	34 (2.6)	302 (21.9)	1,083 (14.2)	40 (5.1)	0
Two or more races	3,960 (2.5)	27 (1.7)	740 (3.3)	26 (2.0)	16 (1.2)	238 (3.1)	0	0
Total Population	160,034	1,620	22,438	1,329	1,379	7,623	791	281

Note: Hispanics may be of any race, so are included in applicable race categories; thus, percentage may not equal 100.
Source: U.S. Census Bureau 2011

3.7.3.2 Low-Income Populations

The U.S. Census Bureau uses a set of income thresholds that vary by family size and composition to detect poverty; poverty thresholds by family size are shown in Table 3.7-3.

Table 3.7-3 Poverty Thresholds by Family Size (2009)

Family Size	Annual Income	Family Size	Annual Income	Family Size	Annual Income
1	$10,830	4	$17,029	7	$33,270
2	$14,570	5	$20,127	8	$37,010
3	$18,310	6	$29,530	9 or more	$34,417

Source: U.S. Department of Health and Human Services 2011

As shown in Table 3.7-4, Niland experiences the greatest percentage of persons living below the poverty level of any of the communities in the Project area (45.4 percent) and has the second lowest median family income ($21,987). Desert Shores has the lowest percentage of persons living below the poverty level (7.8 percent). Westmorland, Brawley, Niland, Salton City, and Bombay Beach each have a greater percentage of the population living below the poverty level than the county as a whole.

Table 3.7-4 Economic Profile of the Project Area (2000)

Population Characteristic	Imperial County	Westmor-land	Brawley	Niland	Salton City	Calipatria	Desert Shores	Bombay Beach
Total Population	160,034	1,620	22,438	1,329	1,379	7,6232	791	281
Percent of Persons below the Poverty Level	21.2	22.3	25.0	45.4	27.0	19.5	7.8	39.1
Median Household Income	$37,595	$28,397	$35,260	$19,837	$32,273	$44,400	$30,000	$17,955
Median Family Income	$42,229	$32,446	$39,674	$21,987	$33,465	$45,236	$48,839	$26,307

Source: U.S. Census Bureau 2011

3.7.4 Impacts and Mitigation Measures

3.7.4.1 Impact Analysis Methodology

Demographic data for the study area were collected to identify minority and low-income populations**.** Following the identification of these populations, each of the resource or issue-area impact analyses contained in this Environmental Impact Statement/Environmental Impact Report were reviewed to determine if the SCH Project's significant impacts would result in a disproportionate health or environmental impact on minority and/or low-income populations.

3.7.4.2 Thresholds of Significance

Significance Criteria

Impacts associated with environmental justice would be significant if the Project would:

- Result in a disproportionate human health or significant environmental impact on minority and/or low-income populations; or
- Result in a disproportionate decrease in the employment and/or economic base of minority and/or low-income populations working or residing in the area surrounding the Project area.

Application of Significance Criteria

A summary of the overall methodology used in applying the significance criteria to the Project alternatives follows:

- **Result in a disproportionate human health or significant environmental impact on minority and/or low-income populations** – The Project would be located in a sparsely populated area; the only nearby residents are a small number of residents and campers at Red Hill Park, which is adjacent to the proposed Alamo River sites. Many impacts would be minor (less than significant) and localized and would not have the potential to affect minority and low-income populations. The Project would restore a portion of the habitat that would be lost as the Salton Sea's salinity level increases and the Sea's water surface elevation decreases. It also would cover exposed playa, reducing fugitive dust emissions throughout the Project's lifetime. As such, it would have long-term benefits to biological resources, aesthetics, recreational resources, and air quality. This analysis focuses on the potential for health and safety impacts from air emissions, impacts from the permanent conversion of land under Williamson Act contracts to nonagricultural use, and disturbance of cultural resources sites.
- **Result in a disproportionate decrease in the employment and/or economic base of minority and/or low-income populations working or residing in the area surrounding the Project area** – As discussed in Section 3.19, Socioeconomics, the SCH Project would create jobs, primarily during construction, and would not result in the loss of jobs or adversely affect the local economy. Thus, this impact is not discussed further.

3.7.4.3 No Action Alternative

The description of the impacts of the No Action Alternative that is included in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (PEIR) (DWR and DFG 2007) is applicable to the SCH Project and summarized below. This alternative would involve construction and operations and maintenance activities associated with pupfish channels and relocating recreational facilities as the Salton Sea recedes. Construction of facilities under the No Action Alternative would potentially expose workers and people that live near or visit the Salton Sea shoreline to dust, vehicle emissions, release of contaminants from the seabed sediments, and noise. Following construction, workers and visitors on the seabed could be exposed to dust from exposed playa and vehicle emissions caused by operations and maintenance activities. Cultural resources on the seabed could be disturbed during construction, which could affect minority populations.

Land use plans for portions of the currently inundated seabed on the Torres Martinez Desert Cahuilla Indian's tribal lands could be implemented under the No Action Alternative because water would no longer continue to inundate these areas.

Under the No Action Alternative, the fish would probably disappear from the Salton Sea before the end of Phase I. Prior to this time, fish capture and consumption would be expected to decline to a level that risks associated with fish consumption would be negligible because few, if any, fish from the Salton Sea would be consumed on a regular basis. However, fish would still persist in the river estuaries. Safe consumption rates for fish in the No Action Alternative would be higher in the New and Alamo river estuaries, but lower in the Whitewater River estuary, than from aquatic habitats associated with existing conditions.

Although habitat conditions (including specific food web organisms) would change under the No Action Alternative, waterfowl would be expected to continue to feed at the Salton Sea, especially in nearshore areas and in the estuarine habitats at the mouths of rivers where elevated selenium concentrations are located. Safe consumption rates for waterfowl under the No Action Alternative would be higher in the Alamo River, but lower in the New and Whitewater rivers, than from aquatic habitats associated with existing conditions.

3.7.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact EJ-1: Construction emissions would have a disproportionate impact on minority and low-income populations (significant impact). As discussed in Section 3.3, Air Quality, Alternative 1 would The Project would contribute incrementally to violations of Federal and state ozone (O_3) and particulate matter (PM_{10}, and $PM_{2.5}$) standards and exceed the Imperial County Air Pollution District's nitrogen oxides (NO_x) and PM_{10} thresholds during construction. These pollutants can have adverse human health effects like chronic respiratory disease, effects on pulmonary function, increased infant mortality, cardiovascular, and respiratory disease levels.

The nearest residential community to the Alternative 1 site is Westmorland, approximately 6 miles south. Westmorland contains a predominantly minority population (only 15.4 percent is identified as white and non-Hispanic), which is a greater than the percentage in Imperial County as a whole. As discussed in Section 3.3, Air Quality, wind patterns in the southeastern Salton Sea tend to blow air toward the southeast. Therefore, the potential exists for construction-related emissions to travel into Westmorland. Due to the known human health effects of NO_X and PM_{10}, this impact would constitute a disproportionately high and adverse effect on a minority population. As discussed above, a number of communities in the study, including Westmorland, have a higher percentage of persons living below the poverty level than the county as a whole, and air emissions also would have a disproportionately higher impact on low-income populations. This impact would be significant when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM AQ-1: Implement fugitive PM_{10} control measures.

MM AQ-2: Implement diesel control measures.

Residual Impact

Implementation of the mitigation measures described above would reduce the PM_{10} and NO_X impacts, but they would not be sufficient to reduce impacts to below the applicable thresholds; thus, the impact would be significant and unavoidable.

Impact EJ-3: Ground-disturbing activities could expose and damage undiscovered prehistoric and historic resources and result in the inadvertent discovery of human remains (significant impact). The Project would be located in an archaeologically sensitive area, and the potential exists to uncover significant, buried, previously unknown prehistoric resources, historic resources, or human remains associated with the area's historical occupation by both Native Americans and Euroamericans, which

would have a disproportionate effect on Native Americans living in the study area. This impact would be significant when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM CR-1: Prepare and implement a survey plan and an inadvertent discovery plan.

Residual Impact

Implementation of MM CR-1 would reduce potential impacts on unknown cultural resources and inadvertently discovered human remains to a less-than-significant level because significant resources would be identified and either avoided or subject to a data recovery program that complied with regulatory agency requirements.

3.7.4.5 Alternative 2 – New River, Pumped Diversion

Impact EJ-1: Construction emissions would have a disproportionate impact on minority and low-income populations (significant impact). The discussion under Alternative 1 is applicable to Alternative 2. MM AQ-1 and MM AQ-2 also are applicable to Alternative 2, but would not reduce the impact to less than significant.

Impact EJ-2: Ground-disturbing activities could expose and damage undiscovered prehistoric and historic resources and result in the inadvertent discovery of human remains (significant impact). The discussion under Alternative 1 is applicable to Alternative 2. MM CR-1 also is applicable to Alternative 2 and would reduce the impact to less than significant.

3.7.4.6 Alternative 3 –New River, Pumped Diversion + Cascading Ponds

Impact EJ-1: Construction emissions would have a disproportionate impact on minority and low-income populations (significant impact). The discussion under Alternative 1 is applicable to Alternative 3. MM AQ-1 and MM AQ-2 are applicable to Alternative 3, but would not reduce the impact to less than significant.

Impact EJ-2: Ground-disturbing activities could expose and damage undiscovered prehistoric and historic resources and result in the inadvertent discovery of human remains (significant impact). The discussion under Alternative 1 is applicable to Alternative 3. MM CR-1 also is applicable to Alternative 3 and would reduce the impact to less than significant.

3.7.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact EJ-1: Construction emissions would have a disproportionate impact on minority and low-income populations (significant impact). The discussion under Alternative 1 is applicable to Alternative 4, except the PM_{10} threshold would not be exceeded. MM AQ-2 is applicable to this alternative, but would not reduce the impact to less than significant.

Impact EJ-2: Ground-disturbing activities could expose and damage undiscovered prehistoric and historic resources and result in the inadvertent discovery of human remains (significant impact). The discussion under Alternative 1 is applicable to Alternative 4. MM CR-1 also is applicable to Alternative 4 and would reduce the impact to less than significant.

3.7.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact EJ-1: Construction emissions would have a disproportionate impact on minority and low-income populations (significant impact). The discussion under Alternative 1 is applicable to Alternative

5, except the PM_{10} threshold would not be exceeded. MM AQ-2 is applicable to this alternative, but would not reduce the impact to less than significant.

Impact EJ-2: Ground-disturbing activities could expose and damage undiscovered prehistoric and historic resources and result in the inadvertent discovery of human remains (significant impact). The discussion under Alternative 1 is applicable to Alternative 5. MM CR-1 also is applicable to Alternative 5 and would reduce the impact to less than significant.

3.7.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact EJ-1: Construction emissions would have a disproportionate impact on minority and low-income populations (significant impact). The discussion under Alternative 1 is applicable to Alternative 6, except the PM_{10} threshold would not be exceeded. MM AQ-2 is applicable to this alternative, but would not reduce the impact to less than significant.

Impact EJ-2: Ground-disturbing activities could expose and damage undiscovered prehistoric and historic resources and result in the inadvertent discovery of human remains (significant impact). The discussion under Alternative 1 is applicable to Alternative 6. MM CR-1 also is applicable to Alternative 6 and would reduce the impact to less than significant.

3.7.5 References

California Department of Water Resources (DWR) and California Department of Fish and Game (DFG). 2007. Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report.

U.S. Census Bureau. 2011. *American FactFinder*. Website (http://factfinder.census.gov/home/saff/main.html?_lang=en) accessed January 24, 2011.

U.S. Department of Health & Human Services. 2011. *The 2009 HHS Poverty Guidelines*. Website (http://aspe.hhs.gov/poverty/09poverty.shtml) accessed January 25, 2011.

3.8 GEOLOGY, SOILS, AND MINERALS

3.8.1 Introduction

This section addresses issues associated with geology, soils, faults and seismicity, and minerals. Construction of the Species Conservation Habitat (SCH) Project alternatives would affect soils and minerals and the structures that would be built could be affected by local faults and seismic and geothermal activity. The compatibility of the SCH Project with future geothermal development is addressed in Section 3.13, Land Use. The study area for geology, soils, and minerals comprises the proposed alternative sites, seismically active areas in the surrounding Salton Basin (refer to Figure 3.8-1 for locations of nearby faults), and local sources of rock and gravel used during construction.

Table 3.8-1 summarizes the impacts of the six Project alternatives on geology, soils, and minerals, compared to both the existing conditions and the No Action Alternative.

Table 3.8-1 Summary of Impacts on Geology and Soils

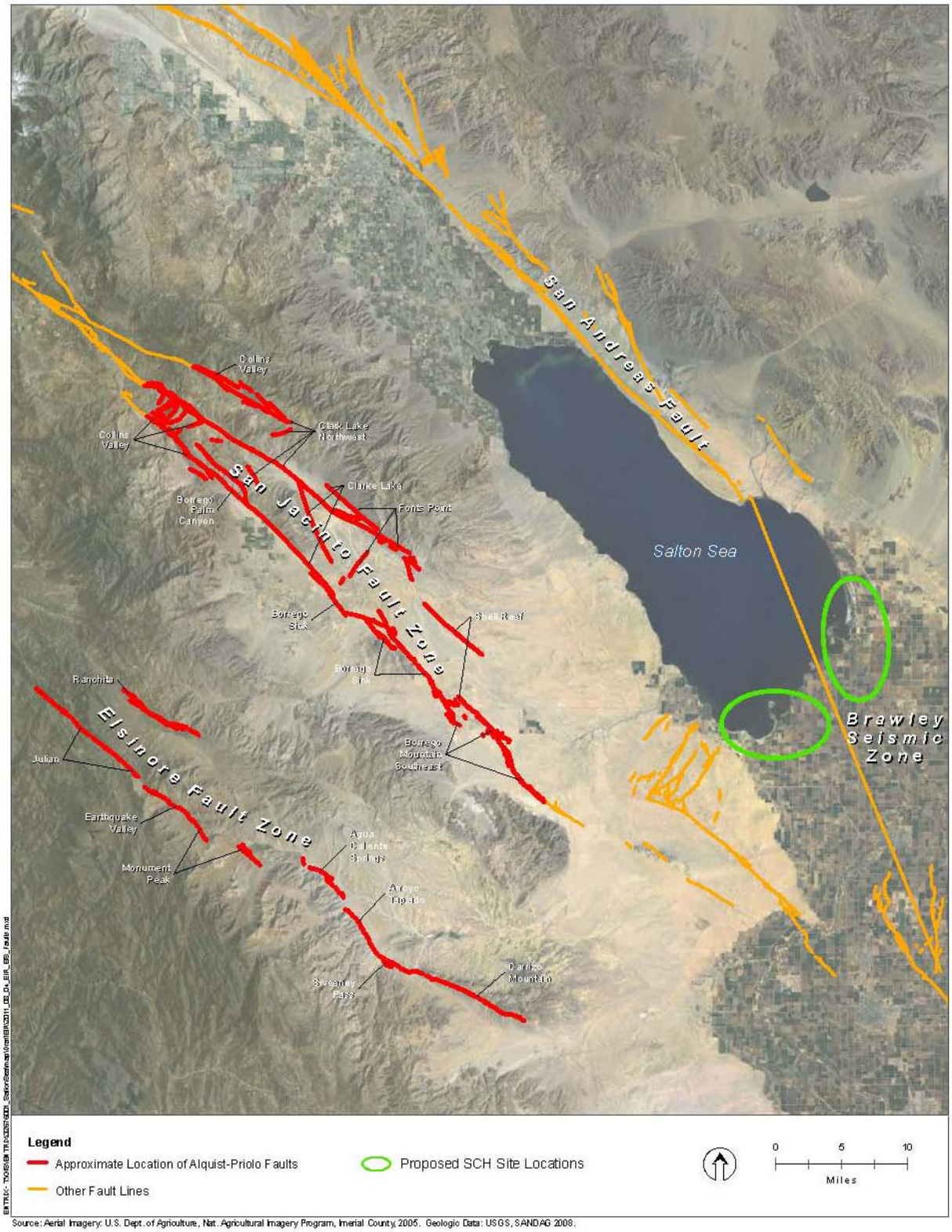
Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact GEO-1: A seismic event could cause the berms to fail and damage the water diversion/conveyance structures.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact GEO-2: Best management practices would be used to prevent soil erosion and the loss of topsoil during construction.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact GEO-3: The Project would be located on unstable soils, potentially affecting the stability of the berms.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact GEO-4: Construction would require the use of rock as riprap or pond substrate.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.8.2 Regulatory Requirements

Alquist-Priolo Earthquake Fault Zone Act

The Alquist-Priolo Earthquake Fault Zone Act (Public Resources Code sections 2621 et seq.) was passed in 1972 to prevent buildings from being constructed over active faults. The Act is designed to mitigate surface fault rupture by preventing construction of buildings for human occupancy across an active fault. It requires state zoning of active faults, and local review and regulation of development within the zones. The proposed Project sites are not located within an Alquist-Priolo special study zone.



Source: Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imerial County, 2005. Geologic Data: USGS, SANDAG 2008.

Figure 3.8-1 Location of Faults near the Salton Sea

California Code of Regulations, Title 24

California Code of Regulations, Title 24, Chapters 16 and 17 include standards for structural and seismic design of structures. As defined by the California Code of Regulations, the Salton Sea is located in Seismic Zone 4; therefore, the seismic performance objectives include:

- To sustain minimal or no damage under minor earthquake ground motion;
- To limit damage to nonstructural features under moderate level earthquake ground motion; and
- To limit damage to structural and nonstructural features without collapse under major level earthquake ground motion.

California Water Code, Division 3

Division 3 of the California Water Code establishes standards and provisions related to dams and reservoirs under the jurisdiction of the California Department of Water Resources (DWR). This regulation delineates general and administrative provisions; powers of DWR including maintenance of operation of water infrastructure, emergency work, investigations and studies, and general procedures; applications for new dams and alterations to existing dams; as well as inspection and approval processes to ensure the safeguard of life and property from dam failure. Section 6025.6 states that "the civil engineer supervising a dam pursuant to subdivision (a) of section 6025.6 shall take into consideration, in determining whether or not a dam constitutes, or would constitute, a danger to life or property, the possibility that the dam might be endangered by seepage, earth movement, or other conditions that exist, or might occur, in any area in the vicinity of the dam."

The Division of Safety of Dams (DSOD), which operates under Division 3 of the California Water Code, reviews plans and specifications for the construction of new dams or for the enlargement, alteration, repair, or removal of existing dams. DSOD must grant written approval before construction can proceed on any new dam (assuming it falls within DSOD jurisdiction). The berms proposed for the Species SCH Project would be constructed using local materials and impound water that is no more than 6 feet from the water surface to the berm's downstream toe. This design consideration places the berms outside the DSOD's jurisdiction (personal communication, D. Gutierrez 2011).

Imperial County General Plan

The Seismic and Public Safety Element of the Imperial County General Plan (1993) contains goals and policies for protection of geologic features, soil resources, and avoidance of geologic hazards. Building codes and grading ordinances establish specific regulations for construction procedures, including erosion control measures.

3.8.3 Affected Environment

The following description of the study area depicts the regional geologic environment, the geologic history of the study area, faulting and seismicity, soils, geologic hazards within the region, and mineral resources.

3.8.3.1 Regional Geologic Environment

The descriptions of the regional geologic environment, geologic history, faults, and historical earthquakes are taken from the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (PEIR) (DWR and California Department of Fish and Game [DFG] 2007) and updated as appropriate. The Salton Sea occupies a portion of the interior-draining Salton Basin. This basin's southern end has been blocked by the deposition of deltaic sediments from the Colorado River, effectively

preventing drainage from the basin to the Gulf of California. The several subbasins that drain into the Salton Sea include the Whitewater River from the San Bernardino, Little San Bernardino, and San Jacinto ranges to the north-northwest, Salt Creek from the Orocopia and Chocolate Mountains to the east, and San Felipe Creek, which drains the Peninsular Range to the West. The largest flow into the Salton Sea comes from the Imperial Valley to the south via the New and Alamo rivers. These rivers primarily convey drainage flows from irrigated lands.

The Salton Basin is located in the Salton Trough, a deep north-west trending structural depression that extends from San Gorgonio Pass to the Gulf of California. The Salton Trough is the northern portion of the rift zone that occurs where the North American (east) and Pacific (west) plates converge. The rift zone includes the Salton Trough, the Colorado River Delta, and the Gulf of California. The rift zone, a low-lying area that occurs because of the downward movement of land between two fault zones, formed during late Cenozoic time. The accumulation of the Colorado River Delta sediments separates the trough from the southern Gulf of California.

The Salton Trough is bounded to the north by the Transverse Ranges geomorphic province, to the northeast by the Mojave Desert geomorphic province, and to the west by the Peninsular Ranges geomorphic province. Northwest-trending faults and associated folding cross the Salton Basin, the Imperial Valley, and the mountains to the west. These faults are predominately right-lateral and can be divided into three main fault zones: the San Andreas, San Jacinto, and Elsinore. These faults are discussed in the “Faults” section below.

The oldest exposed rocks in the region surrounding the Salton Trough are Precambrian gneisses, anorthosites, and schists, as shown on Figure 3.8-2. Younger Paleozoic to Cenozoic plutonic rocks in turn intrude on these rocks. The sediments within the Salton Trough range in age from Miocene to Holocene. The Salton Trough is a large structural depression that has filled with about 19,500 feet or 3.7 miles of sediment since the late Cenozoic.

The oldest sediments are coarse clastic sediments derived from the surrounding crystalline rocks. These deposits are overlain by essentially continuous deposits of volcanics, lacustrine, evaporites, marine, fluvial, and deltaic sediments. The greatest source of sediment is from the Colorado River.

The only marine formation, the Imperial Formation, was deposited during a marine incursion that occurred not long after the initiation of the opening of the Gulf of California about 5,000,000 years ago. Discontinuous outcrops of the formation are found from just south of the international border to San Gorgonio Pass. This formation may be as old as late Miocene but is generally considered to be Pliocene. The marine rocks at the formation’s northern end are thought to be Miocene and may not be correlative with the marine rocks found to the south. These rocks may predate the opening of the Gulf of California and represent a proto-Gulf.

3.8.3.2 Geologic History

The Salton Trough is located in a tectonically complex area. Prior to the formation of the present-day Salton Trough, the region was landward of a back arc resulting from the subduction of the Farallon plate beneath the North American plate. Volcanics formed during this time are found today in the highlands that define the present day rift zone, as well as Precambrian metamorphics. Units exposed in the mountain ranges near the Salton Trough include the San Gorgonio complex, the Chuckwalla complex, and the Orocopia schist. Deposition of early Tertiary sedimentary units occurred in the region prior to the opening of the present day rift basin. These units are consolidated and primarily nonmarine in origin. Major units include the Coachella fanglomerate and the Hathaway, Imperial, and Mecca formations.

Eon	Era	Period		Epoch	Age in Million Years Before Present
Phanerozoic	Cenozic	Quaternary		Recent (Holocene)	0 to 0.01
				Pleistocene	0.01 to 2
		Neogene	Tertiary	Pliocene	2 to 5
				Miocene	5 to 24
		Paleogene		Oligocene	24 to 37
				Eocene	37 to 58
				Paleocene	58 to 66
	Mesozoic	Cretaceous			66 to 144
		Jurassic			144 to 208
		Triassic			208 to 245
	Paleozoic	Permian			245 to 286
		Carboniferous	Pensylvanian		286 to 320
			Mississippian		320 to 360
		Devonian			360 to 408
		Silurian			408 to 438
		Ordovician			438 to 505
		Cambrian			505 to 570
Precambrian	Proterozoic				570 to 2,500
	Archean				2,500 to 3,800
	Pre-Archean				3,800 to 4,600

Figure 3.8-2 Geologic Time Scale

Interlayered with some of the sedimentary units, such as the Coachella fanglomerate, may be intervals of basalt, probably originating from the volcanism associated with the back arc setting. The Imperial Formation is the only major marine sedimentary unit exposed in the Salton Trough and preserves the occurrence of the proto-Gulf of California. It is up to 3,700 feet thick and was deposited 5,000,000 to 7,000,000 years ago.

The rift basin that occurs today from the San Gorgonio Pass south into the Gulf of California formed about 4,000,000 years ago. It is bounded on both sides by a series of fault zones. The downward movement of the land between the fault zones and the subsequent infilling of the trough has resulted in a thick sequence of highly variable sediments. Once the rift basin formed, sediments were deposited originating from the Colorado River, which has flowed both south (its current course) and north into the rift valley, as well as from alluvial material eroded from the surrounding mountain ranges. As a result of this periodic inundation of the rift valley and subsequent evaporation of the lakes, lacustrine (lake) evaporites (deposits) are the dominant sediment type in the northern Salton Trough. Downward percolation of water through these saline units has resulted in the occurrence of rift basinal brines, which characterize the Salton Sea and Brawley geothermal systems.

Most recent geologic units are lacustrine and alluvial sediments originating from the uplands adjacent to the rift basin. Wind action frequently influences surficial units, often resulting in dunes such as the Sand Hills, a 40-mile-long by 5-mile-wide series of wind-blown deposits extending along the Coachella

Canal's eastern side from the United States-Mexico border and the Tule Wash dune located west of the Salton Sea.

Lake Cahuilla is a collective name representing the numerous times the Salton Trough has been flooded by water from the Colorado River. The Colorado River has drained the interior of the North American plate since before the formation of the current rift zone. Because of the natural deposition of sediments at the delta that formed where the Colorado River enters the rift zone, thick accumulations of sediments near the delta's upper zones could result in the river changing course. When this change happened, the river would flow into the rift valley until the river again changed course. The occurrence of the deltaic sediments also prevents the Gulf of California from inundating the Salton Trough, which is below sea level.

The sedimentary record within the Salton Trough documents well the previous occurrences of Lake Cahuilla. Deposition of light-colored calcium carbonate along the cliffs of the present day valley shows that the most recent shoreline was about 40 feet above sea level. Anthropologic, geologic, and freshwater mollusk data indicate that Lake Cahuilla first appeared about 700 and occupied the basin until about 300 years ago. At its largest, the lake is estimated to have been 6 times the size of the current Salton Sea – 100 miles long and 35 miles across. Although Salton Sink was a dry lakebed when Europeans first explored the valley in 1774, the Colorado River is known to have flooded the area at least 8 times between 1824 and 1904 resulting in earlier versions of the Salton Sea.

3.8.3.3 Faults

The Salton Sea Trough has three main fault zones (San Andreas, San Jacinto, and Elsinore). The Coachella Segment of the San Andreas Fault forms the northeastern boundary of the Salton Trough. The fault is evident on the ground surface from north of the Salton Sea to just north of Bombay Beach located on the Salton Sea's eastern shore, but is not evident on the ground surface to the southeast of the Salton Sea. The latest break on this segment is likely greater than 300 years ago. With an estimated accumulated strain of about 25 millimeters/year, a possibility exists that this segment could produce an earthquake with a magnitude of about 7.5 or larger with over 20 feet of offset. The San Jacinto Fault Zone is located just to the west of the Salton Sea and is composed of a complex system of faults including the San Jacinto, San Felipe Hills, Santa Rosa, San Felipe, Superstition Hills, Superstition Mountain, Coyote Creek, and Imperial. The Imperial Valley, located just south of the Salton Sea, is one of the most seismically active regions in Southern California. The Imperial Fault produced a magnitude 6.9 earthquake in 1940. The Elsinore Fault Zone is located west of the San Jacinto Fault Zone and borders the southwestern face of the Coyote Mountains. These fault zones are discussed in more detail below and shown on Figure 3.8-1. The Brawley Seismic Zone also is discussed below.

San Andreas Fault

The San Andreas Fault enters the Salton Trough at the Coachella Valley's northwestern end. This fault system constitutes the main structural boundary between the Pacific and North American plates. Today, the San Andreas Fault Zone is traceable from the Gulf of California northward to Shelter Cove Coast in Humboldt County. Regionally, it is traceable from the town of Niland east of the Salton Sea northward through San Gorgonio Pass. The fault zone continues southward into Mexico as the Sand Hills and Algodones Fault. The San Andreas Fault is right-lateral with an approximate offset of 200 miles. The offset in Southern California is estimated to have begun in the late Miocene and early Pliocene (5,000,000 to 10,000,000 years ago).

San Jacinto Fault Zone

The San Jacinto Fault Zone is a major strand of the San Andreas Fault System. It extends southeastward from Cajon Pass as a series of splays into the Salton Trough. The San Jacinto Fault is an extremely active system. Right lateral displacement on the San Jacinto Fault Zone is about 19 miles. Vertical separations along the zone exceed 8,000 feet in the Santa Rosa Mountains. The San Jacinto Fault is thought to be Plio-Pleistocene based on vertebrate and plant remains but may be younger than 1,000,000 years as indicated by lateral offset of the late Pleistocene Ocotillo Conglomerate.

Elsinore Fault Zone

The Elsinore Fault Zone extends from the northern Peninsular Range southward to the Gulf of California. The fault zone is parallel and west of the San Jacinto Fault Zone. Right lateral displacement along the main fault trace is about 30 miles. Vertical displacement and relief features along this fault reach as much as 9,000 feet. The Elsinore Fault Zone is considered to be older than the San Jacinto Fault, between 1,800,000 and 2,700,000 years ago.

Brawley Seismic Zone

The Brawley Seismic Zone is comprised of the Imperial-Brawley fault system and is a zone of high seismicity extending from the Imperial Fault's northern reach northwest into the Salton Sea. This zone is marked by parallel or near-parallel, closely spaced, step-like, right-lateral faults that trend northwest and are linked by conjugate left-lateral structures. The Sand Hills Seismicity Lineament extends southeast from the San Andreas Fault's southern tip within this seismic zone and may represent the San Andreas Fault's southern extension.

3.8.3.4 Historical Earthquakes

The Imperial Valley portion of the Salton Trough has had more small to moderate earthquakes than any other portion of the San Andreas Fault system. In addition to these smaller earthquakes, 9 earthquakes with magnitudes of 6.0 or greater have occurred along the San Jacinto Fault and 3 of greater than 6.0 have occurred along the Imperial Fault between 1890 and 1972. Two additional earthquakes with magnitudes greater than 6.0 have occurred since 1972. One was on the Imperial Fault (magnitude 6.5, 1979) and the other was on the Superstition Hill Fault (magnitude 6.6 in 1987). Two strong earthquakes (both magnitude 7.1) have been recorded on the Cerro Prieto Fault in Mexicali Valley. These earthquakes occurred in 1915 and 1934. Although earthquakes also occur in the Coachella Valley, the northern Salton Trough is less active seismically than its southern portion. The area also experienced a magnitude 7.2 earthquake in 2010 that was centered in Mexicali, Mexico, approximately 57 miles southeast of the Salton Sea.

3.8.3.5 Soils

Soils Adjacent to the Salton Sea

Soil units within the Salton Trough have formed on fine-grained sediments associated with the occurrence of Lake Cahuilla and alluvial fans from the adjacent highlands. A wide range of desert and alluvial soil types are present, including well-drained sands to silty clay loams in the area adjacent to the Salton Sea. The preliminary geotechnical report prepared for the SCH Project provides additional detail regarding the soils in the area where the proposed ponds would be constructed (Appendix C).

In-Sea Soils

In-Sea soils consist of soils derived from lacustrine (lake) evaporites (deposits) and are summarized below (DWR and DFG 2007):

- **Sea Floor Deposits –** The first layer, Salton Sea Floor Deposits, is composed of recently deposited, very soft to loose, highly plastic clays to silty fine sands. The thickness of this layer ranges from zero to 21 feet with the greatest thickness occurring in the southern and mid-Sea areas.
- **Soft Lacustrine Deposits –** The Soft Lacustrine Deposits were found to underlie the seafloor deposits over much of the Salton Sea's area. These materials consist of highly plastic, soft to very soft clays ranging in thickness from zero to 26 feet. The thickest deposits were found in the Whitewater River delta and the mid-Sea's easterly area.
- **Upper Alluvial Deposits –** The Upper Alluvial Deposits are interspaced between the Soft and Stiff Lacustrine Deposits and are predominant near the Salton Sea's perimeter. These deposits are described as composed of loose to dense silty fine sands with interbedded silt and sand lenses ranging in thickness from zero to 26 feet. The thickest deposits were found in the Salton Sea's northeastern, southwestern, and west-central margins.
- **Upper Stiff Lacustrine Deposits –** The Upper Stiff Lacustrine Deposits underlying both the Soft Lacustrine and Upper Alluvial Deposits, are composed of predominantly stiff to very stiff, highly plastic clays ranging in thickness from four to 31 feet. The thickest deposits were found in the mid-Sea's eastern and southeastern areas, the latter near the Alamo River delta.
- **Lower Alluvial Deposits –** The Lower Alluvial Deposits are similar to the Upper Alluvial Deposits except that their density is greater, ranging in consistency from medium dense to dense. These deposits were predominant in the southern Salton Sea, ranging from zero to 22 feet in thickness.
- **Lower Stiff Lacustrine Deposits –** The Lower Stiff Lacustrine Deposits likely underlies the entire Salton Sea having a thickness much greater than 100 feet. This layer is primarily hard plastic clay.

3.8.3.6 Geologic Hazards

Geologic hazards that may occur in the Salton Trough include the potential for earthquake rupture or shaking (discussed under "Faults" above), subsidence as a result of groundwater overdraft, liquefaction of loose saturated soils during earthquakes, landslides in areas of steep topography, lateral spreading, seiches, and volcanic hazards. These hazards are described below.

Subsidence

Subsidence can occur when pore pressure within a groundwater system is reduced (usually as a result of groundwater extraction) to the point that the aquifer framework compresses. This process is more common in systems where finer-grained sediments such as clay or silt dominate the aquifer framework. Subsidence can also occur as a result of tectonic activity or reservoir loading.

Recent subsidence investigations in the Coachella Valley have focused on its southern portion near the Salton Sea. Increased groundwater pumping to meet increasing water demands makes the area susceptible to subsidence. Subsidence of up to 0.5 foot has occurred for the period 1928 to 1996. Additional subsidence of up to 0.13 foot may have occurred between 1996 and 1998.

Recent investigations in the Imperial Valley evaluated potential subsidence due to geothermal energy generation activities along the southern Salton Sea shoreline. These studies determined that subsidence was not occurring in as a result of geothermal development because the water was being reinjected following energy generation. Subsidence due to other factors is occurring in the southern Salton Sea at a rate of about 10 millimeters per year.

Liquefaction

Liquefaction may occur when shallow (less than 50 feet below grade), saturated, unconsolidated material is subjected to shaking. The shaking causes porewater pressure to increase, and the material to lose its structural integrity and behave as a liquid. It commonly occurs where shallow groundwater occurs, near surface water bodies, or in filled areas. Shallow groundwater occurs in extensive areas of the Salton Trough, and liquefaction is considered to be a hazard in both the Imperial and Coachella valleys.

Landslides

Landslides most commonly occur in areas of and adjacent to steep slopes. Earthquakes may often trigger them. Within the Salton Trough region, landslide potential is greatest along the valley margins. It could also occur on a minor scale along embankments that often occur along canals. Because of the broad, low-lying character of the study area, landslide potential throughout the area is low.

Lateral Spreading

Lateral spreading is the separating or rupturing of the ground surface as a result of strong ground shaking. Lateral spreading commonly occurs along drainage banks, cliffs, or other areas with steep or nearly vertical slopes, where generally loose sediments collapse due to lack of lateral support. Lateral spreading does not necessarily take place along an active fault, but rather is generally associated with liquefaction caused by seismically induced ground shaking. Within the study area, lateral spreading is most likely to occur along river, creek, and drain banks. The potential for lateral spreading to occur along the steep channel slopes of the New and Alamo rivers in the more southern study area is moderate to high. However, the potential for lateral spreading to occur in areas near the Salton Sea is relatively low as the rivers, creeks, and drains tend to have generally gentle to moderately sloping banks near the Salton Sea.

Seiches

Seiches are large waves in lakes produced by either wind or seismic activity. No occurrences of seiches are documented at the Salton Sea. However, because of the Salton Sea's shallowness and the fact that the region is seismically active, the potential exists for a seiche to occur in the Sea.

Volcanic Hazards

Volcanoes, rhyolite domes, geothermal fields, mud pots, and hot springs are indicators that volcanism exists in the Salton Trough. These features are located primarily in the Mexicali and Imperial valleys.

Volcanoes, Mud Volcanoes, and Mud Pots

The Cerro Prieto volcano is located southeast of Mexicali, near the Cerro Prieto Fault and the Cerro Prieto geothermal field. The volcano is a prominent feature in the area, but is not related to the geothermal field. The volcano last erupted between 10,000 and 100,000 years ago. Mud pots, mud volcanoes, geysers, and fumaroles also occur near the Cerro Prieto volcano. An active geyser occurred in the area for several months as recently as 1991.

Mud pots and mud volcanoes are located southeast of the Salton Sea near Niland. The mud volcanoes that occur in this area are 3 to 6 feet in height and up to 10 feet wide. The mud pots are smaller than the mud volcanoes (no more than a couple of feet high or wide). The mud in the mud volcanoes is generally hotter than in the mud pots. Anecdotal observations from local residents report variations in carbon dioxide and temperature variation that may be controlled by seasonal changes or earthquake activity. Mud pots are present adjacent to and within the Project area east of the Alamo River in Morton Bay. Several other sites are currently under water in the Sea near Mullet Island (personal communication, N. Driscoll 2010).

Holocene Rhyolite Domes

Extrusive rhyolite domes are located near the mud pots along the Salton Sea's southern edge. Obsidian Butte is the largest and southernmost rhyolite dome and is estimated to be between 2,400 and 8,500 years old. It is located on the Salton Sea's shoreline and is composed of rhyolite, obsidian, and pumice. Ancestral shorelines of Lake Cahuilla can be observed at Obsidian Butte. The other domes are located at Rock Hill, Red Island, and Mullet Island.

Hot Springs

Hot springs are located in several areas throughout the Salton Trough. They are often associated with the spreading centers of major regional faults.

One prominent area of hot springs occurs to the east of Bombay Beach, on the Salton Sea's eastern shore. The area is referred to as the Hot Mineral Spa Geothermal Resource Area. Numerous wells have been drilled in the area, several of which exhibit artesian flow. Water produced at these wells is from a common source, are meteoric, and are produced from a narrow band of sediments located between the crystalline bedrock of the Chocolate Mountains and the Hot Spring Fault.

Hot springs occur throughout the region, including near Jacumba, Holtville, Canon de Guadalupe, and the city of Desert Hot Springs.

3.8.3.7 Mineral Resources

Minerals found throughout Imperial County include gold, gypsum, sand, gravel, lime, clay, and stone. These resources are extracted through commercial enterprises (County of Imperial 1993). Industrial materials are also extracted commercially, including kyanite, mineral fillers (clay, limestone, sericite, mica, and tuff), salt, potash, calcium chloride, manganese, and sand. A variety of mining/reclamation areas exist in Imperial County, but they are not located in the immediate study area (County of Imperial 1993).

The Project area is located in the Salton Sea Known Geothermal Resource Area (County of Imperial 2006). A Known Geothermal Resource Area is defined as:

> An area in which the geology, nearby discoveries, competitive interests, or other indicia would, in the opinion of the Secretary of the Interior, engender a belief in those who are experienced in the subject matter that the prospects for extraction of geothermal steam or associated geothermal resources are good enough to warrant expenditures of money for that purpose (30 USC [United States Code] section 1001).

Brine produced by geothermal activities contains minerals, although the recovery is dependent upon production costs and market price. At the Salton Sea Known Geothermal Resource Area, the brine is very high in minerals such as sodium, arsenic, antimony, mercury, selenium, potassium, iron, tin, manganese, chlorine, boron, bromine, potash, and zinc. Precious metals, such as silver, gold, and platinum, are present in trace concentrations. Studies of brine in the Salton Sea area have shown substantial differences in the trace element compositions even from relatively closely spaced wells. The total dissolved solids and mineral concentrations in the brine can also change with the well flow rate (County of Imperial 2006).

Since the geothermal brines of the Salton Sea Known Geothermal Resource Area have a greater concentration of valuable minerals, this area's resource is being developed. Cal Energy is operating a zinc extract plant near the Salton Sea. Some of the minerals being extracted from geothermal brines, such as manganese and tin, have strategic value for national defense (County of Imperial 2006).

3.8.4 Impacts and Mitigation Measures

3.8.4.1 Impact Analysis Methodology

The impact assessment for geology and soils is based on the proximity of active faults, frequency and types of seismic events, existing ground acceleration data and models, and the type of existing soils. In addition, the susceptibility and/or contribution of the alternatives to geologic hazards are described in terms of their potential impact on the public. The preliminary geotechnical investigation for the SCH Project conducted by Hultgren-Tillis Engineers (Appendix C) was also reviewed. Impacts on minerals were evaluated through consideration of whether the Project alternatives would preclude the development of geothermal resources in the Project area and the potential for the Project alternatives to result in the loss of important mineral resources.

3.8.4.2 Thresholds of Significance

Significance Criteria

Impacts on geology and soils would be significant if the SCH Project would:

- Have the potential to expose people, property, or structures to substantial adverse effects, including the risk of loss, injury, or death involving:
    - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
    - Strong seismic ground shaking;
    - Seismic-related ground failure, including from soil liquefaction; and
    - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the alternatives, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, seiche, or collapse;
- Be located on expansive or unstable soils, as defined in the Uniform Building Code, creating substantial risks to life or property; or
- Be located in soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Impacts on mineral resources would be significant if the SCH Project would:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan; or
- Result in the loss of access to a known geothermal resource area that would substantially affect existing and future resource extraction activities.

Application of Significance Criteria

Significance criteria have been applied to each alternative. The following list summarizes the overall methodology in the application of the criteria to the alternatives:

- **Expose people, property, or structures to substantial adverse effects from seismic events** – The primary risks associated with seismic activity are related to berm failure or SCH water supply pipeline rupture. While berms would be designed and constructed in accordance with California Building Code requirements, the potential for risk to life and property in the event of collapse is discussed. The potential for conveyance pipeline rupture as a result of seismic events, leading to associated flooding hazards, also is discussed. Landslides are not considered a potential risk in the Project area because of the generally flat topography and are not discussed further.
- **Substantial soil erosion or loss of topsoil** – The potential for substantial soil erosion to occur during construction and release of hydrostatic test water is considered, as is the potential for the erosion to occur in or around the river diversion system. The potential loss of topsoil during pipeline installation also is addressed. The diversion facilities (both pumped and gravity) would be built into the river bank and would not project into the channel; thus, they would not be expected to increase erosion. In addition, the area around the diversion facilities would be treated with riprap or similar material to avoid erosion. Thus, this impact is not addressed further.
- **Location on a geologic unit or soil that is unstable, or that would become unstable** – The existing soils are considered expansive and unstable, and this issue is discussed below. Areas within the Project footprint may have liquefiable and expansive soils and be subject to subsidence and volcanic hazards.
- **Location on expansive or unstable soils, creating substantial risks to life or property** –.Refer to the preceding criterion.
- **Location in soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems** – The Project alternatives would not require the use of septic tanks, nor would residential or related uses be proposed that would require the need for wastewater disposal systems. Therefore, this significance criterion is not addressed further.
- **Loss of availability of a locally or statewide important mineral resource**. The primary loss of such mineral resources would result from the use of rock for pond substrate and well as the loss of access any minerals that may underlie the SCH facilities.
- **Loss of access to a known geothermal resource area.** The potential for conflicts with geothermal activities in general is discussed in Section 3.13, Land Use. As discussed, the Project would not preclude geothermal development and, thus, would not preclude the extraction of minerals from brine should geothermal development be implemented in the Project vicinity.

3.8.4.3 No Action Alternative

The description of the impacts of the No Action Alternative that is included in the PEIR (DWR and DFG 2007) is applicable to the SCH Project and summarized below. This alternative would involve construction and operations and maintenance activities associated pupfish channels, and relocating recreational facilities as the Salton Sea recedes, which could result in short-term construction impacts associated with erosion. No soil/bedrock mineral resources were identified along the shoreline. Specific information related to mineral resources in the Salton seabed was not found during the PEIR's preparation; however, mineral resources may be present. The disturbance of about 35,800 acres of land, and the use of 5,050,000 cubic yards of seabed soils could result in loss of mineral resources in the seabed.

3.8.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact GEO-1: A seismic event could cause the berms to fail and damage the water diversion/conveyance structures (less-than-significant impact). As noted above in Section 3.8.3.4, three main fault zones (San Andreas, San Jacinto, and Elsinore) are located in the Salton Sea Trough. In addition to the San Andreas Fault, which runs beneath the seabed, the San Jacinto Fault Zone is located immediately west of the Sea and is composed of a complex system of faults (DWR and DFG 2007; U.S. Geological Survey 2010). Large seismic events have occurred at the Salton Sea approximately every 200 years, although it has been over 335 years since the last significant earthquake was recorded (Monroe 2007). For these reasons, the potential for ground shaking and rupture within the Project area is high.

No seismically induced safety impacts would result from berm or pipeline failure during construction. Once the ponds and pipelines were filled with water, a berm failure could release water directly to the Salton Sea or onto exposed playa where it would then flow to the Sea. The topography in the ponds' vicinity slopes toward the Salton Sea, and water released from the ponds would flow in this direction rather than inundate the surrounding area. Thus, water released from the ponds as a result of seismic events would not expose people, property, or structures to substantial adverse effects, and impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative. In addition, the SCH's maximum water surface elevation would be -228 feet. This elevation is at or below the elevation of the land to the south of the Project area, making it difficult for adjacent land to be flooded in the event of an SCH berm failure.

Under this alternative, the sedimentation basin would be located upstream at the gravity diversion. The basin elevation would be at an elevation of about -222 feet. This water elevation is below the ground elevation at the basin (i.e., the basin would be dug into the native ground. No risk exists of berm failure that would send water onto adjoining properties.

Although a potential exists for seismic events to damage the water pipelines, they would be constructed of plastic, which would minimize the potential for rupture. Moreover, the pipelines leading from the river would be buried at a depth of approximately 15 feet, which would further minimize the potential for flooding because some water, at least, would be absorbed into the ground and the soil would impede the release of water. The pipelines carrying saline water would be located in the seabed, and any water released from them would flow back into the Salton Sea. Water released from the pipelines as a result of seismic events would not expose people, property, or structures to substantial adverse effects, impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative.

Impact GEO-2: Best management practices would be used to prevent soil erosion and the loss of topsoil during construction (less-than-significant impact). As discussed in Section 2, best management practices would be implemented during construction to minimize the potential for erosion and sedimentation. They would be part of the Stormwater Management Pollution Prevention Plan and would include such measures as preservation of existing vegetation to the extent feasible, installation of silt fences, use of wind erosion control (e.g., geotextile or plastic covers on stockpiled soil), and stabilization of site ingress/egress locations to minimize erosion. Given the implementation of these best management practices, impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative.

Water would be used to perform a hydrostatic test of the saltwater and brackish water pipelines before they were put into service. The test water from the pipelines would be released into either the sedimentation basin or one of the SCH ponds. The water would be released in a controlled manner to minimize the potential for erosion, and any erosion that did occur would be contained within the basin or

the pond. Impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative.

Exposed playa that was recently submerged would be used to construct the berms. It is highly saline and not considered topsoil. Topsoil would be removed during construction of the pipeline leading from the river to the ponds, but it would be stockpiled and replaced in its original location. Thus, any loss of topsoil would be temporary, and the impact would be less than significant when compared to both the existing environmental setting and No Action Alternative.

Impact GEO-3: The Project would be located on unstable soils, potentially affecting the stability of the berms (less-than-significant impact). In general, the lacusterine soils on the Sea bed are weak and may be subject to erosion, piping, settling, and spreading during the life of the Project. These factors would be considered during the geotechnical design and accommodated by allowing for settling in the design and placement of soil, adding features such as a cutoff wall to avoid seepage, and using flatter side slopes on the berms to reduce seepage and add stability. The preliminary geotechnical investigation (Appendix C) showed that the Sea sediments at the pond sites are predominantly fine-grained soils with low strength. These types of soils will readily erode when exposed to even light wave action and are also dispersive in fresh water. (Their performance in brackish water is yet to be evaluated). Compressibility, seepage, and expansion potential are also issues that would need to be addressed through appropriate design. If seepage developed through a berm, the dispersive nature of the soils could lead to the loss of the embankment. Additional geotechnical analysis would be performed prior to construction, however, and the berms would be constructed following appropriate site-specific soil construction techniques, including the use of specialized equipment and flat to moderate slopes. The Project would not cause instability in the surrounding area, and should berm failure occurring during the life of the Project, this would be addressed by repairing the failed section, relocating a section of berm, or changing the berm cross section. As discussed in Impact GEO-1, berm failure would not result in the exposure of people, property, or structures to substantial adverse effects, and impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative.

Impact GEO-4: Construction would require the use of rock or gravel as riprap or pond substrate (less-than-significant impact). The Project would require rock or gravel from local sources to be used as substrate or riprap for the ponds, but these materials are in ready supply, and their use would not result in the loss of availability of a mineral resource that is of local or statewide important. Thus, impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative.

3.8.4.5 Alternative 2 – New River, Pumped Diversion

Impact GEO-1: A seismic event could cause the berms to fail and damage the water diversion/conveyance structures (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, except the pipelines from the New River would not be required, and the sedimentation basin would be located within the ponds at a maximum water surface elevation of -228 feet. This water elevation is below the ground elevation at the basin. That is, the basin is dug into the native ground. No risk exists of berm failure that would send water onto adjoining properties.

Impact GEO-2: Best management practices would be used to prevent soil erosion and the loss of topsoil during construction (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative except no topsoil would be removed during pipeline construction.

Impact GEO-3: The Project would be located on unstable soils, potentially affecting the stability of the berms (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact GEO-4. Construction would require the use of rock or gravel as riprap or pond substrate (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.8.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact GEO-1: A seismic event could cause the berms to fail and damage the water diversion/conveyance structures (less-than-significant impact). The discussions under Alternatives 1 and 2 are applicable to this alternative.

Impact GEO-2: Best management practices would be used to prevent soil erosion and the loss of topsoil during construction (less-than-significant impact). The discussions under Alternatives 1 and 2 are applicable to this alternative.

Impact GEO-3: The Project would be located on unstable soils, potentially affecting the stability of the berms (less-than-significant impact). The discussions under Alternatives 1 and 2 are applicable to this alternative.

Impact GEO-4: Construction would require the use of rock or gravel as riprap or pond substrate (less-than-significant impact). The discussions under Alternatives 1 and 2 are applicable to this alternative.

3.8.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact GEO-1: A seismic event could cause the berms to fail and damage the water diversion/conveyance structures (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact GEO-2: Best management practices would be used to prevent soil erosion and the loss of topsoil during construction (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact GEO-3: The Project would be located on unstable soils, potentially affecting the stability of the berms (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative with the exception of the presence of mud pots east of the Alamo River in Morton Bay. The area of current mud pot exposure would be avoided when locating and constructing Project berms. It is possible, however, that new mud pots could open up during the Project's life. If such a vent were to open up under an existing berm, the release of carbon dioxide gas could erode and undermine the berm, causing it to fail. If the failed berm were located between two ponds (where the water surface elevation would be similar), the water in the two ponds would equilibrate at a new lower level based on the combined volume of water and volume of the ponds. No water would rush between the ponds. If the failed berm were an exterior berm, the water would be released to the Salton Sea or exposed playa. The severity of the release would depend on several factors including the speed at which the failure progressed and the elevation differential between the pondwater surface elevation and the elevation of the Sea or playa. The worst-case elevation differential would be 6 feet. However, no structures downstream of the berm would be at risk. The berm could be rebuilt and at different location to avoid the newly exposed vent. This impact is less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact GEO-4: Construction would require the use of rock or gravel as riprap or pond substrate (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.8.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact GEO-1: A seismic event could cause the berms to fail and damage the water diversion/conveyance structures (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, except the pipeline from the Alamo River would not be required, and the sedimentation basin would be located within the ponds at a maximum water surface elevation of -228 feet. This water elevation is below the ground elevation at the basin. That is, the basin would be dug into the native ground. No risk exists of berm failure that would send water onto adjoining properties.

Impact GEO-2: Best management practices would be used to prevent soil erosion and the loss of topsoil during construction (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative except no topsoil would be removed during pipeline construction.

Impact GEO-3: The Project would be located on unstable soils, potentially affecting the stability of the berms (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

Impact GEO-4: Construction would require the use of rock or gravel as riprap or pond substrate (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.8.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact GEO-1: A seismic event could cause the berms to fail and damage the water diversion/conveyance structures (less-than-significant impact). The discussions under Alternatives 1 and 5 are applicable to this alternative.

Impact GEO-2: Best management practices would be used to prevent soil erosion and the loss of topsoil during construction (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative except no topsoil would be removed during pipeline construction.

Impact GEO-3: The Project would be located on unstable soils, potentially affecting the stability of the berms (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

Impact GEO-4: Construction would require the use of rock or gravel as riprap or pond substrate (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.8.5 References

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3.9 GREENHOUSE GAS EMISSIONS/CLIMATE CHANGE

3.9.1 Introduction

This section focuses on the potential for the Species Conservation Habitat (SCH) Project to affect global climate change through the release of greenhouse gases (GHG) into the atmosphere, both directly (from equipment and vehicle emissions during construction and operations) and indirectly (from use of electricity from off-site power plants).

Global warming is the name given to the increase in the average temperature of the Earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to by unequivocal (Intergovernmental Panel on Climate Change [IPCC] 2007) with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last one hundred years. Continued warming is projected to increase global average temperature between 2 and 11 °F over the next one hundred years.

The causes of this warming have been identified as both natural processes and as the result of human actions. The IPCC concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. However, after 1950, increasing GHG concentrations resulting from human activity such as fossil fuel burning and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Increases in GHG concentrations in the Earth’s atmosphere are thought to be the main cause of human induced climate change. GHGs naturally trap heat by impeding the exit of solar radiation that has hit the Earth and is reflected back into space. Some GHGs occur naturally and are necessary for keeping the Earth’s surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last hundred years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFC), hydrofluorocarbons (HFC), and water vapor. Each of the principal GHGs has a long atmospheric lifetime (one year to several thousand years). In addition, the potential heat trapping ability of each of these gases vary significantly from one another. Methane is 23 times as potent as carbon dioxide, while sulfur hexafluoride is 22,200 times more potent than carbon dioxide. Conventionally, GHGs have been reported as carbon dioxide equivalents (CO_2e). CO_2e takes into account the relative potency of non-CO_2 GHGs and converts their quantities to an equivalent amount of CO_2 so that all emissions can be reported as a single quantity.

The primary man-made processes that release these gases include burning of fossil fuels for transportation, heating and electricity generation; agricultural practices that release methane such as livestock grazing and crop residue decomposition; and industrial processes that release smaller amounts of high global warming potential (GWP) gases such as SF_6, PFCs, and HFCs. Deforestation and land cover conversion have also been identified as contributing to global warming by reducing the Earth’s capacity to remove CO_2 from the air and altering the Earth’s albedo or surface reflectance, allowing more solar radiation to be absorbed.

The study area for GHG emissions and climate change includes the Project site(s), the routes used to transport people, equipment, and materials to the Project site(s), and the areas both within California and out of state where electrical power to serve the Project would be generated. Because GHGs affect climate change on a global level, the area of potential impact is the entire planet.

Table 3.9-1 summarizes the impacts of the six Project alternatives on GHG emissions and climate change, compared to both the existing conditions and the No Action Alternative.

Table 3.9-1 Summary of Impacts on GHG Emissions/Climate Change

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact GHG-1: The Project would generate minor amounts of GHG emissions during construction and operations, both directly and indirectly, that would not have a significant impact on the environment.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact GHG 2: The Project would generate GHG emissions during construction and operations, but would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.9.2 Regulatory Requirements

3.9.2.1 Federal Law, Policies, and Plans

Council on Environmental Quality Guidance

In February 2010, the Council on Environmental Quality (CEQ) issued its *Draft National Environmental Policy Act (NEPA) Guidance on Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, which proposed that projects analyzed under NEPA should consider potential impacts associated with GHG emissions and climate change. The Guidance Memorandum addresses two related issues: (1) the treatment of GHG emissions that may directly or indirectly result from the proposed Federal action and (2) the analysis of potential climate change impacts upon the proposed Federal action. If a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_2-equivalent GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 metric tons of CO_2-equivalent emissions, CEQ encourages Federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHGs. CEQ proposes that

this analysis should also consider applicable Federal, state, or local goals for energy conservation and alternatives for reducing energy demand or GHG emissions associated with energy production.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, the United States Environmental Protection Agency (USEPA) released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required USEPA to develop "… mandatory reporting of greenhouse gases above appropriate thresholds in all sectors of the economy…." The Reporting Rule would apply to most entities that emit 25,000 metric tons of carbon dioxide equivalents (CO_2e) or more per year. Starting in 2010, facility owners are required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule would also mandate recordkeeping and administrative requirements in order for USEPA to verify annual GHG emissions reports.

United States Environmental Protection Agency Endangerment and Cause and Contribute Findings

On December 7, 2009, the Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- **Endangerment Finding:** the current and projected concentrations of the six key well-mixed GHGs—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

3.9.2.2 State Laws, Policies, and Plans

Table 3.9-2 summarizes state laws and executive orders that address climate change. The most significant laws and orders are discussed in greater detail below.

Table 3.9-2 Summary of State Laws and Executive Orders that Address Climate Change

Legislation Name	Signed into Law/ Ordered	Description	California Environmental Quality Act Relevance
SB 1771	09/2000	Establishment of California Climate Registry to develop protocols for voluntary accounting and tracking of GHG emissions.	In 2007, California Department of Water Resources (DWR) began tracking GHG emissions for all departmental operations.
AB 1473	07/2002	Directs ARB to establish fuel standards for noncommercial vehicles that would provide the maximum feasible reduction of GHGs.	Reduction of GHG emissions from noncommercial vehicle travel.

Table 3.9-2 Summary of State Laws and Executive Orders that Address Climate Change

Legislation Name	Signed into Law/ Ordered	Description	California Environmental Quality Act Relevance
SB 1078, 107, EO S-14-08	09/2002, 09/2006, 11/2008	Establishment of renewable energy goals as a percentage of total energy supplied in the State.	Reduction of GHG emissions from purchased electrical power.
EO S-3-05, AB 32*	06/2005, 09/2006	Establishment of statewide GHG reduction targets and biennial science assessment reporting on climate change impacts and adaptation and progress toward meeting GHG reduction goals.	Projects required to be consistent with statewide GHG reduction plan and reports will provide information for climate change adaptation analysis.
SB 1368	9/2006	Establishment of GHG emission performance standards for base load electrical power generation.	Reduction of GHG emissions from purchased electrical power.
EO S-1-07	01/2007	Establishment of Low Carbon Fuel Standard.	Reduction of GHG emissions from transportation activities.
SB 97*	08/2007	Directs OPR to develop guideline amendments for the analysis of climate change in CEQA documents.	Requires climate change analysis in all CEQA documents.
SB 375	09/2008	Requires metropolitan planning organizations to include sustainable communities' strategies in their regional transportation plans.	Reduction of GHG emissions associated with housing and transportation.
EO S-13-08*	11/2008	Directs the Resource Agency to work with the National Academy of Sciences to produce a California Sea Level Rise Assessment Report. And directs CAT to develop a California Climate Adaptation Strategy.	Information in the reports will provide information for climate change adaptation analysis.

California Environmental Quality Act and SB 97

The California Environmental Quality Act (CEQA) requires lead agencies to consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to: raise sea levels, affect rainfall and snowfall, and affect habitat.

Senate Bill 97

California Senate Bill (SB) 97 directed the California Office of Planning and Research to prepare, develop, and transmit to the Resources Agency amendments to the CEQA Guidelines related to the analysis and mitigation of GHG emissions. The amendments became effective on March 18, 2010.

A new section was added to the CEQA Guidelines (section 15064.4) to assist lead agencies in determining the significance of the impacts of GHG emissions. This section urges lead agencies to quantify the GHG emissions of proposed projects where possible. In addition to quantification, this section recommends consideration of several other qualitative factors that may be used in the

determination of significance, including (1) the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting, (2) whether a project's emissions exceed a threshold of significance that the lead agency determines applies to a project, and (3) the extent to which a project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate a project's incremental contribution of GHG emissions.

The guideline amendments do not identify a threshold of significance for GHG emissions, nor do they prescribe assessment methodologies or specific mitigation measures. The guidelines amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion that CEQA grants lead agencies to make their own determinations based on substantial evidence.

In addition, as part of the CEQA Guideline amendments and additions, a new set of environmental checklist questions (VII. *Greenhouse Gas Emissions*) to the CEQA Guidelines Appendix G have been adopted. The new set asks whether a project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

Executive Order S-3-05

Executive Order (EO) S-3-05 made California the first state to formally establish GHG emissions reduction goals. EO S-3-05 includes the following GHG emissions reduction targets for California: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

The final emission target of 80 percent below 1990 levels would put the state's emissions in line with estimates of the required worldwide reductions needed to bring about long-term climate stabilization and avoidance of the most severe impacts of climate change (IPCC 2007).

EO S-3-05 also dictated that the Secretary of the California Environmental Protection Agency coordinate oversight of efforts to meet these targets with the Secretary of the Business, Transportation and Housing Agency; Secretary of the Department of Food and Agriculture; Secretary of the Resources Agency; Chairperson of the Air Resources Board; Chairperson of the Energy Commission; and the President of the Public Utilities Commission. This group was subsequently named the Climate Action Team (CAT).

As laid out in the EO, the CAT has submitted biannual reports to the governor and State legislature describing progress made toward reaching the targets. The CAT is in the process of finalizing their second biannual report on the effects of climate change on California's resources.

Assembly Bill 32

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill No. 32; California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32). AB 32 further details and puts into law the mid-term GHG reduction target established in EO S-3-05—reduce GHG

emissions to 1990 levels by 2020. AB 32 also identifies CARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

The statute lays out the schedule for each step of the regulatory development and implementation.

- By June 30, 2007, CARB had to publish a list of early-action GHG emission reduction measures.
- Prior to January 1, 2008, CARB had to: identify the current level of GHG emissions by requiring statewide reporting and verification of GHG emissions from emitters and identify the 1990 levels of California GHG emissions.
- By January 1, 2010, CARB had to adopt regulations to implement the early-action measures.

In December 2007, CARB approved the 2020 emission limit (1990 level) of 427 million metric tons of CO_2 equivalents of GHGs. The 2020 target requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent below the state's projected "business-as-usual" 2020 emissions of 596 million metric tons of CO_2e.

Also in December 2007, CARB adopted mandatory reporting and verification regulations pursuant to AB 32. The regulations became effective January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for major facilities, those that generate more than 25,000 metric tons per year of CO_2e. To date CARB has met all of the statutorily mandated deadlines for promulgation and adoption of regulations.

Climate Change Scoping Plan

On December 11, 2008, pursuant to AB 32, CARB (2008a) adopted the Climate Change Scoping Plan. This plan outlines how emissions reductions will be achieved from significant sources of GHGs via regulations, market mechanisms, and other actions. Six key elements, outlined in the scoping plan, are identified to achieve emissions reduction targets:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewable energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

The Climate Change Scoping Plan also included recommended 39 measures that were developed to reduce GHG emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures also put the state on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80

percent below 1990 levels. The measures in the approved Scoping Plan will be developed over the next two years and be in place by 2012.

Executive Order S-13-08

EO S-13-08, issued November 14th, 2008, directs the California Natural Resources Agency, California Department of Water Resources, Office of Planning and Research, Energy Commission, State Water Resources Control Board, State Parks Department, and California's coastal management agencies to participate in a number of planning and research activities to advance California's ability to adapt to the impacts of climate change. The order specifically directs agencies to work with the National Academy of Sciences to initiate the first California Sea Level Rise Assessment and to review and update the assessment every two years after completion; immediately assess the vulnerability of the California transportation system to sea level rise; and to develop a California Climate Change Adaptation Strategy.

California Climate Change Adaptation Strategy

In cooperation and partnership with multiple state agencies, the 2009 California Climate Adaptation Strategy summarizes the best known science on climate change impacts in seven specific sectors (public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture; forestry, and transportation and energy infrastructure) and provides recommendations on how to manage against those threats.

Regional Plans and Policies

The CARB Scoping Plan (January 2009) ("The Scoping Plan") states that local governments are "essential partners" in the effort to reduce GHG emissions. The Scoping Plan also acknowledges that local governments have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions rely on local government actions. The Scoping Plan encourages local governments to reduce GHG emissions by approximately 15 percent from current levels by 2020 (CARB 2008b).

Imperial County Air Pollution Control District (2007) does not have any rules or regulations that explicitly address climate change or GHG emissions, nor are any policies or programs currently being developed or implemented.

The current Imperial County General Plan does not contain any goals, objectives, or policies that explicitly address climate change or GHG gas emissions. However, the Conservation and Open Space Element of the General Plan does contain some air quality policies that could reduce GHG emissions, such as "The County shall establish programs and procedures to encourage the conservation of energy by the general public" (County of Imperial 1993).

3.9.2.3 Additional Technical Advisory Information

OPR Technical Advisory, CEQA and Climate Change

In June 2008, OPR published a technical advisory on CEQA and Climate Change to provide interim advice to lead agencies regarding the analysis of GHGs in environmental documents (OPR 2008). The advisory encourages lead agencies to identify and quantify the GHGs that could result from a proposed

project, analyze the impacts of those emissions to determine whether they would be significant, and to identify feasible mitigation measures or alternatives that would reduce any adverse impacts to a less-than-significant level. The advisory recognizes that OPR will develop, and the Natural Resources Agency will adopt amendments to the CEQA Guidelines pursuant to SB 97.

The advisory provides OPR's perspective on the emerging role of CEQA in addressing climate change and GHG emissions and recognizes that approaches and methodologies for calculating GHG emissions and determining their significance are rapidly evolving. OPR concludes in the technical advisory that climate change is ultimately a cumulative impact realizing that no individual project could have a significant impact on global climate. Thus, projects must be analyzed with respect to the incremental impact of the project when added to other past, present, and reasonably foreseeable probable future projects. In order to make a determination of cumulative significance, OPR recommends that lead agencies undertake an analysis, consistent with available guidance and current CEQA practice (OPR 2008).

The technical advisory points out that neither CEQA nor the CEQA Guidelines prescribe thresholds of significance or particular methodologies for performing an impact analysis. "This is left to lead agency judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable" (OPR 2008). OPR recommends that "the global nature of climate change warrants investigation of a statewide threshold of significance for GHG emissions" (OPR, 2008). Until such a standard is established, OPR advises that each lead agency should develop its own approach to performing an analysis for projects that generate GHG emissions (OPR 2008).

OPR sets out the following process for evaluating GHG emissions. First, agencies should determine whether GHG emissions may be generated by a proposed project, and if so, quantify or estimate the emissions by type or source. Calculation, modeling or estimation of GHG emissions should include the emissions associated with vehicular traffic, energy consumption, water usage and construction activities (OPR 2008).

Agencies should then assess whether the emissions are "cumulatively considerable" even though a project's GHG emissions may be individually limited. OPR states: "Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment" (OPR 2008). Individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice (OPR 2008).

Finally, if the lead agency determines emissions are a cumulatively considerable contribution to a significant cumulative impact, the lead agency must investigate and implement ways to mitigate the emissions (OPR 2008). OPR states: "Mitigation measures will vary with the type of project being contemplated, but may include alternative project designs or locations that conserve energy and water, measures that reduce vehicle miles traveled by fossil-fueled vehicles, measures that contribute to established regional or programmatic mitigation strategies, and measures that sequester carbon to offset the emissions from the project" (OPR 2008). OPR concludes that "A lead agency is not responsible for wholly eliminating all GHG emissions from a project; the CEQA standard is to mitigate to a level that is "less than significant" (OPR 2008). The technical advisory includes a list of GHG reduction measures in Attachment 3 that can be applied on a project-by-project basis.

California Air Pollution Control Officers Association (CAPCOA)

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) issued a "white paper" on evaluating and addressing GHGs under CEQA (CAPCOA 2008). This resource guide was

prepared to support local governments as they develop their climate change programs and policies. Though not a guidance document, the paper provides information about key elements of CEQA GHG analyses, including a survey of different approaches to setting quantitative significance thresholds. Some of thresholds discussed include:

- Zero (all emissions are significant);
- 900 metric tons/year CO_2e (90 percent market capture for residential and non-residential discretionary development);
- 10,000 metric tons/year CO_2e (potential CARB mandatory reporting level for Cap and Trade program);
- 25,000 metric tons/year CO_2e (the CARB mandatory reporting level for the statewide emissions inventory);
- Unit-based thresholds – based on identifying thresholds for each type of new development and quantifying significance by a 90 percent capture rate.

3.9.3 Affected Environment

3.9.3.1 Global Climate Trends and Associated Impacts

The rate of increase in global average surface temperature over the last hundred years has not been consistent; the last three decades have warmed at a much faster rate – on average 0.32°F per decade. Eleven of the twelve years from 1995 to 2006, rank among the twelve warmest years in the instrumental record of global average surface temperature (going back to 1850) (IPCC 2007).

During the same period over which this increased global warming has occurred, many other changes have occurred in other natural systems. Sea levels have risen on average1.8 millimeters per year; precipitation patterns throughout the world have shifted, with some areas becoming wetter and other drier; tropical cyclone activity in the North Atlantic has increased; peak runoff timing of many glacial and snow fed rivers has shifted earlier; as well as numerous other observed conditions. Though it is difficult to prove a definitive cause and effect relationship between global warming and other observed changes to natural systems, there is high confidence in the scientific community that these changes are a direct result of increased global temperatures (IPCC 2007).

3.9.3.2 California Climate Trends and Associated Impacts

Maximum (daytime) and minimum (nighttime) temperatures are increasing almost everywhere in California but at different rates. The annual minimum temperature averaged over all of California has increased 0.33°F per decade during the period 1920 to 2003, while the average annual maximum temperature has increased 0.1°F per decade (Moser et al. 2009).

With respect to California's water resources, the most significant impacts of global warming have been changes to the water cycle and sea level rise. Over the past century, the precipitation mix between snow and rain has shifted in favor of more rainfall and less snow (Mote et al. 2005; Knowles, Dettinger, and Cayan 2006) and snow pack in the Sierra Nevada is melting earlier in the spring (Kapnick and Hall 2009). The average early spring snowpack in the Sierra Nevada has decreased by about 10 percent during the last century, a loss of 1.5 million acre-feet of snowpack storage (DWR 2008). These changes have significant implications for water supply, flooding, aquatic ecosystems, energy generation, and recreation throughout the state. During the same period, sea levels along California's coast rose 7 inches (DWR 2008). Sea level rise associated with global warming will continue to threaten coastal lands and infrastructure, increase flooding at the mouths of rivers, place additional stress on levees in the Sacramento-San Joaquin Delta,

and will intensify the difficulty of managing the Sacramento-San Joaquin Delta as the heart of the state's water supply system.

3.9.3.3 Local Climate

Local climate is discussed in Section 3.3, Air Quality.

3.9.4 Impacts and Mitigation Measures

Climate change could influence future water supplies and Project operations in future years. Possible changes in Project water supplies include changes in the surface water inflow to the Sea from the major and minor tributaries. The river flow may increase if climate change results in a wetter conditions or decrease under drier conditions. Another climatic factor that could change is evaporation. The rate of evaporation may increase or decrease in response to changes in annual temperatures and relative humidity. Finally, a possible response to climate change may be a change in irrigated acreage or the applied water per acre, which would affect the amount of agricultural water entering the New and Alamo rivers. This type of change however, is bounded by the available water in the Imperial Irrigation District system.

The SCH Project would respond to changes in available water or evaporation by changing, if necessary, the diversion rate from the rivers.

The analysis of future Sea salinity was prepared using the CEQA baseline analysis included in the Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report (PEIR) (Department of Water Resources and California Department of Fish and Game 2007). The PEIR analysis (PEIR Appendix H2) analyzed flow variability associated with climate change or other factors and estimated that there could be up to 200,000 acre-feet of variability in the annual river flow because of possible climate changes. The average annual flow of the New and Alamo rivers in the past 50 years has been approximately 1.1 million acre-feet. The variability analyzed in the PEIR is therefore up to 18 percent of the historic annual flow.

Data from the PEIR were used in the assessment of future storage and salinity of the Sea with the SCH Project present. Specifically, data from PEIR Table H2-2-3 and Table H2-2-4 (Salton Sea elevation and salinity) were used in a spreadsheet model that superimposed the SCH operations on this projected record. The model was used to assess Project impacts and estimate future salinity of the Sea for each alternative. For this analysis the existing evaporation rate was used without any adjustment for potential future conditions. Three sensitivity runs were then conducted using an annual evaporation that is 50 percent, 100 percent, and 200 percent higher than current conditions. The results showed minor model sensitivity to the evaporation change as measured in Salton Sea storage, area, and salinity.

In summary, potential variability in future conditions because of climate change is addressed through the use of the PEIR CEQA baseline and additional evaporation rate sensitivity analyses. These future conditions are speculative at this time, but the SCH can accommodate the changed conditions and remain operational. The remainder of this impact analysis focuses on the potential impacts of the SCH Project on climate change.

3.9.4.1 Impact Analysis Methodology

The analysis estimates direct and indirect GHG emissions resulting from operation of construction equipment; passenger vehicle trips during construction and operation, transportation of construction materials and equipment, transportation of material inputs for operation or maintenance, waste generation and disposal of materials during construction and operation (included in trucking), and generation of

electricity used for Project operation. Appendix H2 provides detailed lists of construction equipment, anticipated construction schedules, and emission calculations.

Emission calculations for off-road equipment and on-road vehicles were performed using the most recent emission factors published by the South Coast Air Quality Management District (SCAQMD 1993, updated in 2008)[1] and USEPA (2011). Construction is expected to require about 2 years of planned work activities beginning in 2013, although potential delays related to weather, protection of sensitive resources, material delivery, and unforeseen underground conditions could occur. Extending the schedule longer than 2 years would not affect the GHG analysis because it is based on total Project emissions (tonnes), which would remain unchanged.

Grid electric power would be used to operate the water transfer pumps and would utilize both in-state generation and imported power from other western states. California Climate Action Registry (CCAR 2009) GHG emission factors were used in conjunction with GWPs[2] (USEPA 2011) to estimate mixed-resource GHG impacts (CO_2, CH_4, N_2O) comprising fossil-fuel (natural gas, coal), renewable (wind, solar, geothermal, biomass), hydroelectric, and nuclear generation. Pumping power estimates (motor horsepower) for each alternative were converted into annual megawatt-hours (MW-hr) assuming 92 percent motor efficiency and continuous operation (8,760 hours per year), which is conservative. Results are expressed in CO_2e below in Tables 3.9-3 through 3.9-6.

3.9.4.2 Thresholds of Significance

Significance Criteria

It is unlikely that any single project by itself could have a significant impact on the environment. However, the cumulative effect of human activities has been clearly linked to quantifiable changes in the composition of the atmosphere, which in turn have been shown to be the main cause of global climate change (IPCC 2007). Therefore, the analysis of the environmental effects of GHG emissions from this Project will be addressed as a cumulative impact analysis. No quantitative GHG thresholds of significance that would apply to the Project have been established at the Federal, state, or local levels. For purposes of this analysis, an impact would be significant if the Project would:

- Generate GHG gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases, including the state goal of reducing greenhouse gas emissions in California to 1990 levels by 2020, as set forth by the timetable established in AB 32, California Global Warming Solutions Act of 2006.

Application of Significance Criteria

The following summarizes the overall methodology used in applying the significance criteria to the Project alternatives:

[1] Imperial County Air Pollution Control District does not publish its own emission factors; hence, those of the neighboring SCAQMD were used. The SCAQMD off-road factors are based on Federal standards pursuant to 40 CFR 89.112; SCAQMD on-road factors are based on 40 CFR 86 et seq. vehicle category standards; the SCAQMD factors are output from CARB's OFFROAD and EMFAC applications, respectively, which reference the cited regulations, respectively.

[2] Greenhouse gases have been assigned a "global warming potential" factor. For CO_2, CH_4, and N_2O, the GWP factors are 1, 21, 310, respectively.

- **Generate GHG emissions that may have a significant impact on the environment** – The Project alternatives would directly and indirectly generate GHG emissions from construction and operational activities. Direct GHG emissions would be generated through fuel consumption, fuel combustion resulting from construction activities, emissions from the transportation of goods and other materials to the sites, and workers traveling in vehicles to and from the sites during both construction and operation.. The Project also would indirectly result in GHG emissions, primarily from the generation of electric power used by the freshwater pumps required for Alternatives 2, 3, 5, and 6, and the seawater pumps required for all alternatives; additionally, a negligible amount of power would be required at the trailer that would serve as office space for the permanent employees. GHG emissions of each alternative are analyzed, and the potential for these emissions to have a significant impact on the environment is compared with existing environmental conditions and regulations.
- **Conflict with any applicable plan, policy, or regulation of an agency for reducing GHG emissions** – The potential for the Project alternatives to conflict with state regulations intended to reduce GHG emissions is analyzed and discussed for each alternative. Included is an evaluation of the alternatives with respect to the state goal of reducing GHG emissions in California to 1990 levels by 2020, as set forth by the timetable established in AB 32, California Global Warming Solutions Act of 2006. Currently, no Federal regulations limit GHG emissions of CO_2 and CH_4; however, emissions of N_2O are regulated (albeit indirectly) through limitation of NO_X emissions as a criteria pollutant under New Source Performance Standards and Federal, state, and local operating permits.

3.9.4.3 No Action Alternative

Emissions of GHGs occur at local and landscape scales, but are distributed globally. As described in Section 3.9.3, GHG emissions have increased greatly over the past 100 years and are linked to increases in global temperatures and other climate changes. The impact of these increased atmospheric concentrations of GHGs constitutes a substantial existing and ongoing adverse impact. As previously mentioned, analysis of the environmental effects of GHG emissions from the Project alternatives is addressed as a cumulative impact analysis only. Because the No Action Alternative by definition cannot contribute to a cumulative impact, no significance determination is made.

3.9.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact GHG-1: The Project would generate minor amounts of GHG emissions during construction and operations, both directly and indirectly, that would not have a significant impact on the environment (less-than-significant impact). Tables 3.9-3 through 3.9-6 summarize the direct GHG emissions from construction and direct and indirect emissions associated with operations; details are included in Appendix H2. Emissions can be compared to those occurring under the No Action Alternative. None of the Project activities would occur under the No Action Alternative; hence, zero emissions would occur.

As shown in Table 3.9-3, construction would generate approximately 5,800 metric tonnes of CO_2e over the course of 2 years. These emissions would be temporary and would cease upon completion of work. Moreover, they would be well under the amount of GHG emissions that major facilities are required to report emissions (25,000 metric tons of carbon dioxide equivalents (CO_2e) or more per year).

Table 3.9-3 Estimated Construction GHG Emissions for Alternatives 1 to 6

Greenhouse Gas	Project Alternative						
	No Action	1	2	3	4	5	6
	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes
Carbon Dioxide (GHG - CO_2)	0	5,724	4,742	6,569	3,357	3,019	3,911
Methane (GHG - CH_4)	0	0.4	0.4	0.5	0.3	0.2	0.3
Nitrous Oxide (GHG - N_2O)	0	0.2	0.2	0.2	0.1	0.1	0.1
Carbon Dioxide Equivalents (CO_2e)	0	5,796	4,800	6,650	3,400	3,057	3,960

Sources: SCAQMD 1993, updated in 2008; USEPA 2011

Notes:

Units are metric tonnes (1,000 kilograms or 2,204.6 pounds).

Totals include importing equipment from other areas in state.

Table 3.9-4 Estimated Operational Direct GHG Emissions for Alternatives 1 to 6

Greenhouse Gas	Project Alternative						
	No Action	1	2	3	4	5	6
	tonnes	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr
Carbon Dioxide (GHG - CO_2)	0	94	93	102	82	83	87
Methane (GHG - CH_4)	0	0.008	0.008	0.009	0.007	0.007	0.007
Nitrous Oxide (GHG - N_2O)	0	0.004	0.004	0.004	0.003	0.003	0.003
Carbon Dioxide Equivalents (CO_2e)	0	96	94	103	83	84	88

Sources: SCAQMD 1993, updated in 2008; USEPA 2011

Note:

Units are metric tonnes (1,000 kilograms or 2,204.6 pounds).

Table 3.9-5 Estimated Operational Indirect GHG Emissions from Electric Power Usage for Alternatives 1 to 6

Greenhouse Gas	Project Alternative						
	No Action	1	2	3	4	5	6
	tonnes	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr
Carbon Dioxide (GHG - CO_2)	0	2,275	1,954	3,004	1,400	817	2,362
Methane (GHG - CH_4)	0	0.09	0.08	0.13	0.06	0.03	0.10
Nitrous Oxide (GHG - N_2O)	0	0.03	0.02	0.03	0.02	0.01	0.03
Carbon Dioxide Equivalents (CO_2e)	0	2,284	1,962	3,017	1,406	820	2,373

Source: CCAR 2009

Table 3.9-6 Estimated Operational Combined Direct and Indirect GHG Emissions for Alternatives 1 to 6

Greenhouse Gas	Project Alternative						
	No Action	1	2	3	4	5	6
	tonnes	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr	tonnes/yr
Carbon Dioxide (GHG - CO_2)	0	2,369	2,047	3,106	1,482	899	2,449
Methane (GHG - CH_4)	0	0.10	0.09	0.13	0.07	0.04	0.11
Nitrous Oxide (GHG - N_2O)	0	0.03	0.03	0.04	0.02	0.01	0.03
Carbon Dioxide Equivalents (CO_2e)	0	2,380	2,057	3,120	1,489	904	2,461

Sources: SCAQMD 1993, updated in 2008; USEPA 2011; CCAR 2009

Notes:

Units are metric tonnes (1,000 kilograms or 2,204.6 pounds).

Totals include power plant emissions outside the Project vicinity.

The primary power demand during operations would result from pumping. Minimal power would be required at the trailer that would serve as office space for the permanent employees. During operation, the pumps required to move water from the river to the ponds would utilize an average of 975 motor horsepower and consume about 6,925 MW-hr of electric power annually. Thus, indirect GHG emissions from the fossil fuel component of mixed electric power generation would increase as a result of the Project. Indirect GHG emissions from electric power used by the pumping plants would be about 2,280 metric tonnes CO_2e annually (CCAR 2009). As noted in Section 3.9.2.2, the State of California has imposed a number of regulations requiring the reduction of GHG emissions and the increased use of renewable energy sources. Thus, power required to operate the Project pumps would increasingly come from sources that minimized the production of GHG emissions.

In addition to indirect generation emissions, direct GHG emissions from maintenance equipment and vehicles would be about 96 metric tonnes CO_2e annually. Combined direct and average indirect operational emissions would be about 2,380 metric tonnes CO_2e annually.

Due to its small scale and requirements imposed on power sources by the State of California, the Project's impacts on the environment as a result of the GHG emissions generated during construction and operations would be less than significant when compared to both the existing environmental setting and the No Action Alternative. Moreover, the SCH Project would comply with the best management practices outlined in Section 2, which would reduce the amount of GHGs generated by the Project.

Impact GHG-2: The Project would generate GHG emissions during construction and operations, but would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions (less-than-significant impact). The SCH Project would not have the potential to conflict with or be inconsistent with plans to reduce or mitigate GHGs. Project-level, such as the SCH Project, are not explicitly addressed in existing plans to reduce or mitigate GHGs. Therefore, the SCH Project would not be in conflict with or inconsistent with those plans, because it would not preclude the attainment of the goals or objectives of applicable plans. For example, this Project would not affect the sectors addressed by AB 32 such that a goal or objective of the plan would no longer be attainable. This impact would be less than significant when compared to both the existing environmental conditions and the No Action Alternative.

3.9.4.5 Alternative 2 – New River, Pumped Diversion

Impact GHG-1: The Project would generate minor amounts of GHG emissions during construction and operations, both directly and indirectly, that would not have a significant impact on the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, except emissions would be lower (refer to Tables 3.9-3 to 3.9-6).

Impact GHG 2: The Project would generate GHG emissions during construction and operations, but would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.9.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact GHG-1: The Project would generate minor amounts of GHG emissions during construction and operations, both directly and indirectly, that would not have a significant impact on the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, except emissions would be higher (refer to Tables 3.9-3 to 3.9-6).

Impact GHG 2: The Project would generate GHG emissions during construction and operations, but would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.9.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact GHG-1: The Project would generate minor amounts of GHG emissions during construction and operations, both directly and indirectly, that would not have a significant impact on the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, except emissions would be lower (refer to Tables 3.9-3 to 3.9-6).

Impact GHG 2: The Project would generate GHG emissions during construction and operations, but would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.9.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact GHG-1: The Project would generate minor amounts of GHG emissions during construction and operations, both directly and indirectly, that would not have a significant impact on the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, except emissions would be lower (refer to Tables 3.9-3 to 3.9-6).

Impact GHG 2: The Project would generate GHG emissions during construction and operations, but would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.9.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact GHG-1: The Project would generate minor amounts of GHG emissions during construction and operations, both directly and indirectly, that would not have a significant impact on the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, except emissions would be higher (refer to Tables 3.9-3 to 3.9-6.)

Impact GHG 2: The Project would generate GHG emissions during construction and operations, but would not conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.9.5 References

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3.10 HAZARDS AND HAZARDOUS MATERIALS

3.10.1 Introduction

This section discusses hazards and hazardous materials as they relate to public health and worker safety. The public health hazards considered include risk of selenium exposure due to consumption of fish from the Species Habitat Conservation (SCH) ponds and waterfowl that have foraged at the ponds, risks from a potential increase in mosquitoes at the SCH ponds and sedimentation basins, and potential for air and dust-borne diseases. The potential for increased wildland fire risks also is considered, as are potential risks to civilian and military aircraft associated with bird airstrikes. Issues associated with hazardous materials include the potential for public and worker exposure to hazardous wastes or hazardous materials. Risks associated with unexploded ordnance are not considered in this analysis because the Salton Sea Test Base (SSTB) and any Salton Sea fixed bomb target sites are outside the SCH Project boundaries (Department of Defense 2009). Issues associated with geological hazards such as earthquake and flooding potential are discussed in Section 3.8. Potential impacts on air quality that could affect public health are discussed in Section 3.3.

The study area encompasses the construction footprint and associated easements, as well as nearby airspace; surrounding communities also are included in the study area because of the potential for an increase in mosquito vectors.

Table 3.10-1 summarizes the impacts of the six Project alternatives on hazard and hazardous materials, compared to both the existing conditions and the No Action Alternative.

Table 3.10-1 Summary of Impacts on Hazards and Hazardous Materials

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact HAZ-1: Hazardous materials used during construction could be released into the environment.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-5: Project construction could increase the risk of wildland fire.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses.	Existing Condition	S	S	S	S	S	S	MM HAZ-1: Worker training will be provided to workers who may be exposed to air-borne

Table 3.10-1 Summary of Impacts on Hazards and Hazardous Materials

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
								diseases during excavation activities. Training will include recognizing symptoms and use of personal protective equipment.
	No Action	S	S	S	S	S	S	Same as Existing Condition
Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HAZ-8: Selenium and dichlorodiphenyldichloroethylene (DDE) levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.10.2 Regulatory Requirements

3.10.2.1 Hazards and Hazardous Materials

Hazards and hazardous materials are generally characterized by chemical and physical properties that cause a substance to be considered hazardous, including toxicity, ignitability, corrosivity, and reactivity. Within typical construction sites, materials that could be considered hazardous include fuels, motor oil, grease and other lubricants, solvents, soldering and welding equipment, and glues. Also, excavation may expose buried hazardous materials resulting from prior use of the site or adjacent property.

Resource Conservation and Recovery Act of 1976 (42 USC Section 6901-6987)

The goal of the Resource Conservation and Recovery Act (RCRA), a Federal statute passed in 1976, is the protection of human health and the environment, the reduction of waste, the conservation of energy and natural resources, and the elimination of the generation of hazardous waste as expeditiously as possible. The Hazardous and Solid Waste Amendments (HSWA) of 1984 significantly expanded the scope of RCRA by adding new corrective action requirements, land disposal restrictions, and technical requirements. The corresponding regulations in 40 CFR sections 260-299 provide the general framework for managing hazardous waste, including requirements for entities that generate, store, transport, treat, and disposed of hazardous waste. In California, the United States Environmental Protection Agency (USEPA) has delegated most of the regulatory responsibilities to the State. In California, the RCRA

program is codified through the Health and Safety Code sections 25100 et seq., and implemented through the CCR, Title 22, Division 4.5, Environmental Health Standards for the Management of Hazardous Wastes.

Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5)

This statute is the basic hazardous waste law for California. The Hazardous Waste Control implements the Federal RCRA cradle-to-grave waste management system in California. California hazardous waste regulations can be found in Title 22, Division 4.5, Environmental Health Standards for the Management of Hazardous Wastes. The program is administered by the Department of Toxic Substances Control (DTSC).

Hazardous Material Release Response Plans and Inventory Law (California Health and Safety Code, Division 20, Chapter 6.95)

This state right-to-know law requires businesses to develop a Hazardous Material Management Plan or a "business plan" for hazardous materials emergencies if they handle more than 500 pounds, 55 gallons, or 200 cubic feet of hazardous materials. In addition, the business plan includes an inventory of all hazardous materials stored or handled at the facility above these thresholds. This law is designed to reduce the occurrence and severity of hazardous materials releases. The administering agency for the SCH Project would be the Certified Unified Program Agency, in this case, the Imperial County. Imperial County Public Health Department, Section of Environmental Health and Consumer Protection Services.

3.10.2.2 Public Health and Safety

Mosquito Abatement and Vector Control District Law (California Health and Safety Code, Sections 2002(j)(k); 2060(b))

This law specifies that the person or agency claiming ownership, title, or right to property or who controls the diversion, delivery, conveyance, or flow of water shall be responsible for the abatement of a public nuisance that is caused by, or as a result of, that property or the diversion, delivery, conveyance, or control of that water. "Public nuisance" means any of the following:

1. Any property, excluding water, that has been artificially altered from its natural condition so that it now supports the development, attraction, or harborage of vectors. The presence of vectors in their developmental stages on a property is prima facie evidence that the property is a public nuisance.

2. Any water that is a breeding place for vectors. The presence of vectors in their developmental stages in the water is prima facie evidence that the water is a public nuisance.

3. Any activity that supports the development, attraction, or harborage of vectors, or that facilitates the introduction or spread of vectors.

"Vector" means any animal capable of transmitting the causative agent of human disease or capable of producing human discomfort or injury, including, but not limited to, mosquitoes, flies, mites, ticks, other arthropods, and rodents and other vertebrates.

California Public Resources Code

The California Public Resources Code includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on construction equipment that has an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire

hazard areas; and specify fire suppression equipment that must be provided onsite for various types of work in fire-prone areas.

3.10.2.3 Other Applicable State and Local Agencies

Other state and local agencies involved in enforcing public health and safety laws and regulations in the study area include the following.

CalEPA - Office of Environmental Health Hazard Assessment (OEHHA) – Responsible for evaluating the potential public health risks of chemical containments in sport fish and issuing state advisories, when appropriate, OEHHA is also consulted by other agencies interested in assessing the health risk of fish consumption during the process of developing water quality or clean-up "criteria." There are key differences between fish consumption advisories and other environmental risk criteria; advisories consider the significant benefits of fish consumption, while criteria may be strictly risk-based and may not take into account other factors.

California Department of Public Health – Provides resources and information for Public Health concerns in California, which include Hantavirus cardiopulmonary syndrome (HCPS), valley fever, and West Nile virus.

California Occupational Safety and Health Administration (Cal/OSHA) – Has oversight of worker safety. Regulations dealing with worker safety are found in Title 8 California Code of Regulations. These sections require that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to worker safety during construction and operation, fire safety, and hazardous materials use, storage, and handling.

Imperial County Vector Control District (ICVCD) – Responsible for vector control in the study area, including detecting and reducing the spread of mosquito-borne disease through surveillance and abatement activities.

3.10.3 Affected Environment

3.10.3.1 Hazardous Materials

Contamination can result from leaking underground storage tanks, solid waste disposal sites, and historic leaks from pipelines or other industrial sites that were improperly managed. Information concerning the presence and current disposition of hazardous wastes was obtained from the government databases listed in Table 3.10-2. Pesticide use in the surrounding agricultural areas also has resulted in the presence of pesticides, primarily dichlorodiphenyldichloroethylene (DDE), in the sediments at the proposed alternative sites. The highest surface sediment DDE concentrations documented have been at the Alamo River sites (mean sediment concentrations of approximately 13 nanograms per gram [ng/g]). Surface sediment DDE concentrations were lower at the East New River site, and lowest at the Mid and Far West New River sites (mean 1-3 ng/g). The highest subsurface (5-30 cm deep) sediment DDE concentrations were found in East New River (mean approximately 9 ng/g) and immediately adjacent to the Alamo River mouth in Morton Bay (mean approximately 25 ng/g). Lower concentrations of DDE were found at the Middle New River and Alamo River North (Davis Road) sites. The lowest DDE concentrations were found at the Far West New River sites (mean approximately 1 ng/g; Wang et al. 2011). (Refer to Section 3.11, Hydrology and Water Quality for additional detail regarding the presence of pesticides at the New and Alamo river sites).

Table 3.10-2 Online Databases Used to Search for Hazardous Materials Records

Database	Government Department	Type	Description	Link to Source Page
EnviroStor	DTSC	State	Site cleanup, site mitigation, and Brownfields reuse programs	http://www.envirostor.dtsc.ca.gov/public/
CERCLIS	USEPA	Federal	National Priorities List sites and progress	http://www.epa.gov/superfund/sites/cursites/
Geotracker	State Water Resources Control Board	State	Environmental information for Leaking Underground Storage Tanks; Underground Storage Tanks; Spills, Leaks, Investigations, and Cleanups; and land disposal sites in California	https://geotracker.swrcb.ca.gov/
RCRA Information System	USEPA	Federal	Hazardous waste handlers	http://www.epa.gov/enviro/html/rcris/rcris_query_java.html
Solid Waste Information System	California Department of Resources Recycling and Recovery (CalRecycle)	State	Solid waste facilities	http://www.calrecycle.ca.gov/
TRI	USEPA	Federal	Toxic releases reported by state	http://www.epa.gov/tri/tridata/state_data_files.htm

The results of a search of the databases in Table 3.10-2 identified the sites listed in Table 3.10-3 as located within the general Project area. The two CalEnergy geothermal facility sites are located within the area where the SCH Project's brackish water pipeline from the Alamo River could be located. During maintenance operations at the geothermal facility (including high pressure washing of the piping, removal of sediments from the brine ponds, and the removal of filter cake from the clarifiers), these solid scale sediment cake materials were released to on-site surface soils in the vicinity of these maintenance operations. Each of these activities contributed to arsenic and lead contaminated soil impacts on the site at levels that require further cleanup to protect site workers, human health, and the environment. A draft cleanup plan to excavate, remove and transport arsenic and lead contaminated soil at the facility has been prepared by DTSC. DTSC has determined that there is no immediate risk to the public because the facility is fenced, restricted to facility personnel, and not located near residential or commercial areas. DTSC will oversee the proposed soil excavation, removal and transportation activities and ensure work is performed in a manner protective of human health and the environment (DTSC 2010).

Table 3.10-3 Description of Sites with Hazardous Waste Identified from Database Search

Database	Government Dept.	Potential Hazards Site	Site Information	Comments
Geotracker	Colorado River Basin Regional Water Quality Control Board (CRBRWQCB) (Region 7)	No	910 West Vail Road, Calipatria Site borders Project area	Leaking underground fuel tank. Completed, case closed as of 8/25/1992. Potential contaminant was diesel, media affected was soil.
Geotracker	CRBRWQCB (Region 7)	No	JM Leathers Geothermal Plant JM Leathers Powerplant Land Disposal Site 342 West Sinclair Road, Calipatria	Active landfill, no violations. Opened in 1965.
Solid Waste Information System	CalRecycle	No	7015 Brandt Road, Calipatria [a]	Composing operation, permitted since 2002. Last inspection 5/17/21010, no violations or areas of concern.
EnviroStor	DTSC	Yes	CalEnergy Facility, 480 West Sinclair Road, Calipatria [a]	Tiered permit site. Samples taken on site have elevated levels of heavy metals including arsenic, barium, copper, lead and zinc.
EnviroStor	DTSC	Yes	CalEnergy Facility, 342 West Sinclair Road, Calipatria [a]	Tiered permit site. Samples taken on site have elevated levels of heavy metals including arsenic, barium, copper, lead and zinc.

Note:
a. Sites are located within area where the brackish water pipeline from the Alamo River could be located.

3.10.3.2 Public Health

Noncancer Health Risks from Selenium Exposures through Fish and Waterfowl Consumption

Selenium is known to be present in the Salton Sea, and a State health advisory has been issued for human consumption of fish from the Salton Sea. In general, selenium concentrations in the Alamo River are higher than the selenium concentrations in the New River, and both have higher selenium concentrations than the Salton Sea (Amrhein and Smith 2011; C. Holdren, Reclamation, unpublished data).

Selenium is a metalloid found naturally, but highly variably, throughout the environment. Although toxic at relatively low levels, selenium is also a required nutrient. The current Recommended Dietary Allowance (RDA) for selenium is 55 micrograms (µg) per day for the general adult population, 60 µg/day for pregnant women, and 70 µg/day during lactation. Selenium is found in a variety of inorganic and

organic forms; however, in animal tissues, most selenium occurs as the amino acids selenomethionine or selenocysteine. Fish and other food samples are analyzed for total selenium content, as nutritional and toxicity values have not been developed for specific chemical forms of the element (Klasing and Brodberg 2008).

OEHHA has developed Fish Contaminant Goals (FCGs) and Advisory Tissue Levels (ATLs) for evaluating selenium non-cancer risk from fish consumption (Klasing and Brodberg 2008). FCGs are estimates of contaminant levels in fish that pose no significant health risk to individuals consuming sport fish at a standard consumption rate over a lifetime. FCGs are based solely on public health considerations without regard to economic considerations, technical feasibility, or the counterbalancing benefits of fish consumption. The FCG for selenium is 7.4 milligrams per kilogram (mg/kg) wet weight (which equates to 30 mg/kg dry weight), assuming an adult consumption rate of 32 grams per day or one 8-ounce (prior to cooking) fillet per week (Klasing and Brodberg 2008). ATLs, while still conferring no significant health risk to individuals consuming sport fish in the quantities shown over a lifetime, were developed with the recognition that there are unique health benefits associated with fish consumption. The ATL for selenium is 4.9 – 15 mg/kg wet weight (20-61 mg/kg dw) for one 8-ounce serving per week.

Selenium concentrations in fish have been measured and modeled at the Salton Sea. Tilapia collected in 2005 from the Salton Sea (but not at the Project area) had selenium concentrations in muscle tissue of 1.5 to 3.0 mg/kg wet weight, with a mean of 2.0 mg/kg wet weight (California Department of Water Resources [DWR] and California Department of Fish and Game [DFG] 2007), while Moreau et al. (2007) reported a mean of 9.0 mg/kg wet weight. Fillet (muscle tissue) and whole body selenium measurements were very similar for tilapia (Moreau et al. 2007), about 1.11 times greater for fillets than whole body (DWR and DFG 2007, Appendix G).

Each of these measured selenium tilapia tissue concentrations can be used to estimate the total intake of selenium by eating tilapia for comparison to selenium acute and chronic toxicity thresholds. However, because the toxicity of selenium depends on many factors, including the several forms selenium can take (e.g., selinide, selinate, selinomethinanine) regulators and public health officials have resorted to providing more simplistic estimates of the acceptable risk to selenium in fish tissue by estimating the safe number of meals per month using accepted HHRA risk parameters. As can be seen in Table 3.10-4, estimates of the number meals per month, based on the selenium concentration in the tilapia muscle tissue can vary from only 17 to over 60 depending on the suite of risk factors used by the modeler. The designation by OEHHA of the number of tilapia meals (nine per month) is very conservative and is based on their assumption that the selenium concentrations in tilapia from the area may be within the reported ranges, but may also be higher (using conservative uncertainty parameters). Clearly, the number of tilapia meals per month recommended by OEHHA would be well below the likely number of tilapia meals that would result in no significant risk to consumers.

Screening-level human health risk assessments of fish and duck tissue consumption (i.e., maximum safe consumption rates) are discussed in Appendix G of the *Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report* (PEIR) (DWR and DFG 2007). Recreational fishing occurs at the Salton Sea, although it has likely declined compared to the past when the fisheries were more productive (DWR and DFG 2007, Appendix G). Consumption of waterfowl by recreational hunters is another possible selenium exposure pathway. Most waterfowl taken by hunters are from areas supplied by Colorado River water (e.g., at the Imperial Wildlife Area, Sonny Bono Salton Sea National Wildlife Refuge, and private duck clubs), which has a lower selenium concentration than water from the New and Alamo rivers. Current consumption rates and selenium concentrations for duck tissues are unknown. In the absence of site-specific fish and waterfowl consumption rates for the Salton Sea, maximum safe consumption rates that correspond to specific levels of noncancer adverse health effects were estimated for the assessment.

For the Salton Sea, OEHHA's public health advisory limits fish consumption to two servings per week for all consumers (OEHHA 2009). Several other health risk assessments related to selenium exposure from fish consumption have been developed for the Salton Sea, as summarized in Table 3.10-4 (DWR and DFG 2007; Moreau et al. 2007). These safe consumption rates are comparable to the present advisory limit issued by OEHHA.

Table 3.10-4 Comparisons of Estimated Safe Fish and Duck Consumption Rates and Advisories for the Salton Sea Based on Selenium Concentrations in Fish Tissues

Description	Tissue Concentration Selenium (mg/kg wet weight)	Maximum Safe (grams/week)	Consumption Rate (meals/month)	Reference
Adult consumption of tilapia muscle tissue		910-1,330	17-25	Costa-Pierce et al. 2000
Adult consumption of tilapia muscle tissue	1.25 – 3.4[a]	720-1,960	13-34	DWR and DFG 2007, Appendix G
Adult consumption of tilapia muscle tissue	9.0 mean	810-1,190	15-23	Moreau et al. 2007
Adult consumption of Salton Sea fish (tilapia, croaker, sargo, orangemouth corvina) muscle tissue	-	-	9[b]	OEHHA 2009
Adult consumption of duck tissue	1.03 – 2.79	884-2,379	23-62	DWR and DFG 2007, Appendix G

Notes:

a. Tissue concentrations modeled for existing conditions Source: (DWR and DFG 2007).

b. Fish advisory limits stated 2 meals per week which is equivalent to 9 meals per month.

Health Risks from Exposure to Dichlorodiphenyltrichloroethane (DDT) and its Metabolites through Fish Consumption

Dichlorodiphenyltrichloroethane (DDT) and its derivatives dichlorodiphenyldichloroethane (DDD) and DDE can enter the food chain from sediments and bioaccumulate to affect consumers. Poulsen and Peterson (2006) developed sediment bioaccumulation screening levels (SLV_{BH}) for evaluation of human health risks by determining acceptable fish tissue levels of DDE for carcinogens and noncarcinogens, and then using a relationship between fish tissue and sediment concentrations to calculate acceptable sediment concentrations. Two SLV_{BH} were defined, one for the general population (0.24 nanograms per gram [ng/g]) and another more protective standard (0.0038 ng/g) for population segments that consume fish more often (e.g., subsistence, recreational, or Native American users) or consume whole fish. Existing DDE concentrations in surface and subsurface sediments at proposed pond sites (Table 3.10-5) greatly exceed the SLVs for the general population and for more frequent consumers.

Table 3.10-5 Sediment DDE Concentrations (ng/g dry weight) for Existing Conditions/No Action and SCH Project

		Existing Conditions and No Action		SCH Project[2]		Difference between Existing/No Action and Project	
Alternative	Pond Units	Mean	Maximum	Mean	Maximum	Mean	Maximum
1	New East	6.5	23.7	7.2	28.0	0.7	4.3
	New Middle	2.8	8.0	3.5	14.7	0.7	6.7
2	New East	6.5	23.7	7.1	27.6	0.6	3.9
	New Middle	2.8	8.0	3.6	15.7	0.8	7.7
	New Far West	1.1	2.9	1.0	2.7	-0.7	- 0.2
3	New East	6.5	23.7	7.1	27.9	0.6	4.2
	New Middle	2.8	8.0	3.5	14.7	0.7	6.7
	New Far West	1.1	2.9	1.1	2.7	-0.6	- 0.2
4	Alamo Morton Bay	13.7	32.4	15.7	45.0	2.0	12.6
5	Alamo Morton Bay	13.7	32.4	19.2	66.6	5.5	34.2
	Alamo - north	13.4	34.4	12.9	34.8	- 0.5	0.4
6	Alamo Morton Bay	13.7	32.4	17.7	57.3	4.0	24.9
	Alamo - north	13.4	34.4	12.9	34.8	-0 .5	0.4

1. DDE concentrations (mean and maximum values) in undisturbed surface sediments (0 to 5 centimeters deep) measured at each location (Amrhein and Smith 2011; Wang et al. 2011)

2. Expected (calculated) DDE concentrations for each SCH alternative, based on field measurements of surface sediments (0 to 5 centimeters) and subsurface sediments (5 to15 and 15 to 30 centimeters deep) (Wang et al. 2011), and weighted according to proportion of pond area that would remain undisturbed but inundated (surface 0- to 5-centimeter concentrations) and area disturbed by construction [borrow ditches for berms, excavated swales and channels, borrow for habitat islands) (subsurface 5- to 30-centimeter concentrations)]. "Mean" is the area weighted average calculated using mean values for surface and subsurface sediment. "Maximum" average concentrations were also calculated, using maximum observed values of surface and subsurface sediments. This approach was used as a hypothetical upper bound of potential risk, because DDE concentrations below 30 centimeters are unknown and construction could disturb deeper sediments.

Total DDT tissue concentrations measured in fish collected from the New and Alamo rivers regularly exceed the National Academy of Sciences recommended maximum concentration (1,000 ng/g; CRBRWQCB 2002a, b, 2005) and the U.S. Food and Drug Administration Action Level (5,000 ng/g; CRBRWQCB 2002a, b, 2005). The National Academy of Sciences guidelines are meant to protect species that consume DDT at all food chain levels, while Food and Drug Administration Action Levels are intended to protect humans from the chronic effects of DDT consumption, and are based on contaminated food consumption quantity and frequency (CRBRWQCB 2002a, b). USEPA risk analyses indicate that a 70-kg person would be subject to an unacceptable risk from DDT contamination if the individual consumes more than 10 grams per day of tilapia collected near the mouths of the New and Alamo rivers (Costa-Pierce et al. 2000). Studies suggest that DDE concentrations measured in Salton Sea tilapia are unlikely to cause non-cancerous health effects in anglers, but consumption of more than four meals of tilapia per week may result in a 1×10^{-5} increase in cancer risk (Moreau et al. 2007). These

values, however, are based on DDT and DDE concentrations reported from small sample sizes, and further research is required to refine estimates of risk from consumption of Salton Sea fish contaminated with DDT and its metabolites. Following OEHHA's public health advisory limiting fish consumption to two servings per week for all consumers (Table 3.10-4; OEHHA 2009) would result in minimal risk to humans from DDE exposure under existing conditions.

Mosquito Vectors

Another potential public health hazard is the risk of disease transmitted by vectors. Mosquitoes are the primary insect vector of concern in the study area because they are known carriers of human and animal diseases. The most important diseases in the study area associated with mosquitoes are the West Nile virus and the Saint Louis encephalitis virus.

West Nile virus is spread by mosquitoes that feed on the blood of infected birds and other animals and can transmit the virus to humans. While most people infected with West Nile virus exhibit mild or no symptoms, severe infections can lead to encephalitis and can be fatal. West Nile virus first appeared in California in 2002. West Nile virus activity can be detected among dead birds, mosquito pools, and sentinel chickens. In 2004, 58 counties detected West Nile virus activity, with 779 human cases reported and 28 West Nile virus associated fatalities (California Vectorborne Disease Surveillance System [CalSurv] 2010). In 2010, 35 counties detected virus activity, with 105 human cases reported and three fatalities.

Wild birds are the maintenance and amplifying hosts of Saint Louis encephalitis virus, which is transmitted among birds and to humans by mosquitoes. Human infection with Saint Louis encephalitis virus can result in mild to severe illness, with case-fatality rates ranging from 3 percent to 30 percent. Since 1945, 597 human cases of Saint Louis encephalitis virus have been reported in California. The most recent outbreaks occurred in 1984 in the Los Angeles Basin (26 cases) and in 1989 in the southern San Joaquin Valley (29 cases). The last human case reported was in 1997, virus activity has not been detected in mosquito pools or sentinel chickens since 2003 (CalSurv 2010).

Air and Dust-Borne Diseases

Two airborne diseases and public health risks potentially exist within the study area – valley fever (or coccidiomycosis) and HCPS.

Valley fever is a fungal infection caused by coccidioides organisms. It can cause fever, chest pain and coughing, among other signs and symptoms. The coccidioides species of fungi that cause valley fever are commonly found in the soil in certain areas. Coccidiodes organisms can grow under environmental extremes of temperature, salinity and alkaline conditions. These fungi can be stirred into the air by anything that disrupts the soil, such as farming, construction, and wind. Airborne spores can be inhaled into the lungs, where they multiply and grow. Most people who breathe the spores (about 60 percent) develop no symptoms at all. The rest develop flu-like symptoms. Without treatment, valley fever can lead to severe pneumonia, meningitis, and even death. However, when properly treated at the first sign of symptoms, most people will recover without problems. Once infected, the body usually establishes lifetime immunity against future infections. The disease is not contagious, so it cannot spread from one person to another.

HCPS is a rare, but often fatal, disease of the lungs. HCPS was first recognized in 1993 in the southwestern United States. HCPS infections are associated with domestic, occupational, or recreational activities that bring humans into contact with rodents and their excreta, usually in rural settings in poorly ventilated buildings. There have been no reported HCPS cases in Imperial County from 2001-2009

(CPHD 2009). High risk areas and activities are vacant structures and rodent handling. Most outdoor locations are considered low risk (CDC 2004).

3.10.3.3 Bird Airstrike Hazards

Collisions between birds and aircraft are a concern, both for civilian and military aircraft, and can result in the loss of aircraft and personnel or lead to costly repairs. The Federal Aviation Administrative (FAA) Wildlife Strike Database contains records of reported wildlife strikes since 1990 (FAA 2011a). Strike reporting is voluntary; therefore, this database only represents the information the FAA has received from airlines, airports, pilots, and other sources. No airstrikes with civilian aircraft were reported in Imperial County during this time, although a Naval Air Facility (NAF) El Centro lost an F-18 jet to a bird strike in October 1995 (Zakrajsek 2002).

Birds are most frequently found at low altitudes; consequently, the risk of a bird strike is greatest near airfields. Seventy-five to 90 percent of birdstrikes involving civil aircraft occurred near airports, primarily during takeoff and landing. Large birds, such as geese and pelicans, have result in the greatest damage to aircraft. Military aircraft face additional risks because they often engage in low altitude, high speed, and training flights (Zakrajsek 2002).

Civilian airports closest to the Salton Sea include the Imperial County Airport, Brawley Municipal Airport, Cliff Hatfield Memorial Airport in Calipatria, and Salton Sea Airport in Salton City. Information regarding the types of air traffic experienced at each of the local airports, the approximate distance to the proposed New and Alamo river pond sites, and the average number of daily aircraft operations at each airport is summarized in Table 3.10-6.

Table 3.10-6 Public Airports near the Salton Sea

Airport Name	Location	Distance to New River Ponds	Distance to Alamo River Ponds	Uses	Average Daily Aircraft Operations
Brawley Municipal Airport	Brawley, California	12 miles	14 miles	Transient general aviation – 45% Local general aviation – 45% Air taxi – 9%	105
Cliff Hatfield Memorial Airport	Calipatria, California	8 miles	5.5 miles	Transient general aviation – 100%	29
Imperial County Airport	Imperial, California	18.5 miles	23.5 miles	Transient general aviation – 45% Local general aviation – 47% Air taxi – 2% Commercial – 2% Military – 4%	107

Source: AirNav.com 2010

The nearest military installation is Naval Air Facility (NAF) El Centro, located approximately 17 miles south of the Salton Sea. The base is an integral part of military air training missions in the United States, providing realistic training opportunities to active and reserve military units, and it is the winter home of the Blue Angels. Every month, 7 to 12 squadrons and up to 1,600 personnel train at NAF El Centro. NAF El Centro also provides base support to Naval Aviation Squadrons and is associated with R-2510 and R-2512 Restricted Airspace Ranges that provide for critical military operations for weapons and air combat

training (personal communication, R. Thompson 2010). R-2510 encompasses approximately 155,000 acres several miles south and west of the Salton Sea. R-2512 is approximately 63,000 acres and located further east (Figure 3.10-1). The Kane West Military Operations Area (MOA) overlies a portion of the New River sites, and the Kane East MOA overlies the remaining portion of the New River sites, as well as the Alamo River sites. The MOA extends from 30,000 feet above ground level upward (FAA 2011b). Two military training routes, flown at low altitudes by military aircraft, are present in the vicinity of the sites. Visual route (VR 296) bisects the New River sites and VR 1211 runs adjacent to both the New and Alamo river sites.). No evidence of bird strikes has been reported on these two routes for the past year, and they are used only infrequently (three to four times per year on average) (personal communication, J. Nodd 2011).

3.10.4 Impacts and Mitigation Measures

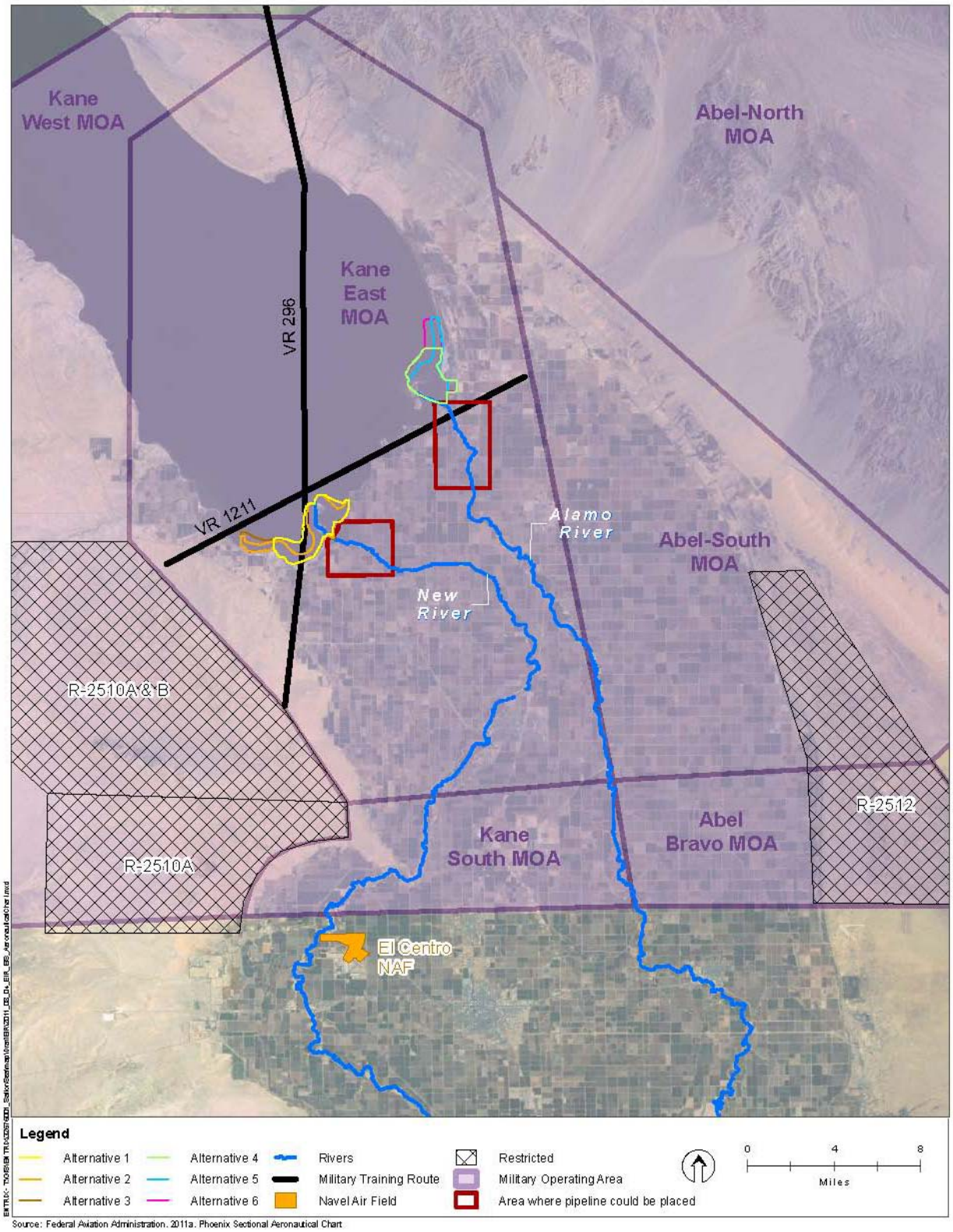
3.10.4.1 Impact Analysis Methodology

The methodology for analyzing exposure to hazardous materials was: 1) to verify the presence of areas of historical contamination in the study area that could be encountered and released during excavation or ground disturbance activities, and 2) to evaluate the relative risk from hazardous materials that would be used, stored, and transported by the SCH Project based on their toxicity, volumes, and potential for release. Impacts related to pesticide exposure were based on the duration of the exposure period.

The method for analyzing the impact to public health from mosquito vectors was related to the potential for the SCH Project to lead to an increase of breeding habitat for the primary vector species, *Culex tarsalis*, as well as the effectiveness of the Mosquito Control Plan prepared for the Project (Appendix F). Impacts from air and dust-borne diseases were analyzed based on their potential presence and the amount of disturbance that could cause a release to the air, thereby increasing human exposure.

The potential human health risk associated with ingestion of fish and waterfowl from the study area was analyzed for selenium and DDE, the most prevalent pesticide documented in sediment. For selenium, the analyses from the PEIR (DWR and DFG 2007, Appendix G) and Moreau et al. (2007) were used to assess human health risk under existing conditions. Selenium concentrations in fish tissue (whole fish, mg/kg dry weight) were estimated from an ecorisk model of selenium impacts on biota (Sickman et al. 2011), and converted to wet weight equivalents according to the methods used in the PEIR (DWR and DFG 2007, Appendix G). Each of the Project alternatives was compared to levels of selenium in fish and waterfowl under existing conditions to determine whether the selenium concentrations would be expected to increase or decrease and whether those increases would be expected to exceed estimated safe fish consumption rates and advisories for the Salton Sea. The probability of human exposure based on the projected level of sport fishing and waterfowl hunting in the study area also was considered.

For DDE, the potential human health risk for fish consumption was analyzed based on existing sediment DDE concentrations (Wang et al. 2011). Because DDT and its metabolites bind to the sediments, construction and operation of habitat ponds on the New River playa would result in increased exposure to subsurface sediments with elevated DDE concentrations. Expected sediment DDE concentrations were calculated for each alternative using the area-weighted approach described in Table 3.10-5. The area-weighted DDE concentration (SCH Project column) of inundated pond sediment (undisturbed playa surface, borrow ditches, habitat swales, and submerged edges of berms and islands) was compared to existing conditions (i.e., DDE concentration of undisturbed surface sediment) to determine whether exposure to DDE would change due pond construction and inundation. These values were also compared to sediment bioaccumulation screening levels (SLV_{BH}) developed by Poulsen and Peterson (2006) for the general population (0.24 ng/g) and more frequent consumers (0.0038 ng/g).



Source: Federal Aviation Administration. 2011a. Phoenix Sectional Aeronautical Chart

Figure 3.10-1 Military Airspace near the New and Alamo River Sites

The risk of wildland fires was related to ignition or fuel sources introduced by the Project alternatives and the existing wildland fire risk in the study area.

The potential for hazards associated with bird airstrikes to increase as a result of the SCH Project was evaluated by comparing the concentration of birds expected to be present as a result of the Project to those expected under current and future conditions.

3.10.4.2 Thresholds of Significance

Significance Criteria

Impacts associated with hazards and hazardous materials would be significant if the SCH Project would:

- Create a significant hazard to the public or the environment through the routine transport, storage, use, or disposal of hazardous materials; or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; or be located on a site which is included on a list of hazardous materials sites compiled by the Federal or state government, and as a result could create a significant hazard to the public or the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school;
- Be located within an airport land use plan or within 2 miles of a public use or private use airport or airstrip and result in a safety hazard for people residing or working in the area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- Expose people or structures to a significant risk of loss injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands;
- Create sufficient vector habitat to pose a threat to public health; or
- Increase concentrations of potentially harmful substances in sport fish and waterfowl that could result in a substantial new human health risk or new or more severe consumption advisories.

Application of Significance Criteria

The following summarizes the overall methodology used in applying the significance criteria to the Project alternatives:

- **Create a significant hazard through transport, storage, use, exposure, or disposal of hazardous materials or be located on designated hazardous materials site** – The analysis considers whether the SCH Project would expose either the public or workers to risks from exposure to hazardous materials during construction, operations, and maintenance and whether Project construction would occur on a site known to contain hazardous materials.
- **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of a school** – No schools are located within or immediately adjacent to the study area. Therefore, this criterion was not considered in the evaluation.
- **Be located within an airport land use plan or within 2 miles of a public use or private use airport or airstrip and result in a safety hazard –** There are no public or private use airports within 2 miles of the study area, but military training routes and other military aircraft operations occur in the vicinity of both the New and Alamo river ponds, and R-2510 is approximately 6 miles west of the

New River ponds. The potential impact of the SCH Project to increase or attract bird populations that could cause an increase in bird strikes by aircraft from the Naval Air Facility El Centro training ranges was evaluated.

- **Impair the implementation of an adopted emergency response or evacuation plan** – This issue is addressed below.
- **Exposure to wildfires –** The analysis considers whether a Project alternative would contribute an ignition source or a significant source of fuel for a wildland fire.
- **Create sufficient vector habitat to pose a threat to public health** – The analysis considers whether a Project alternative would create new breeding habitat for mosquitoes that posed a threat to public health.
- **Increase concentrations of potentially harmful substances in sport fish and waterfowl** – The analysis considers whether a Project alternative would expose the public to rates of selenium or other contaminants beyond maximum exposures considered protective of human health from the consumption of fish or waterfowl.

3.10.4.3 No Action Alternative

The description of the impacts of the No Action Alternative that is included in the PEIR (DWR and DFG 2007) is applicable to the SCH Project and summarized below. The No Action Alternative would involve construction and operations and maintenance activities for pupfish channels. Additionally, Imperial Irrigation District (IID), as mitigation for the IID Water Conservation and Transfer Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at Salton Sea State Recreation Area, as well as boat launches along the shoreline.

Hazardous Materials and Wastes

The main hazards considered in this analysis include exposure of hazardous materials during construction and operations and maintenance to unexploded ordnance. The risk of exposure during excavation of the Seabed and shoreline soils is related to the extent of the activities. Under the No Action Alternative, about 35,800 acres of land would be disturbed, including 5,050,000 cubic yards of Seabed soils that would be used during construction.

Other than the potential presence of ordnance and explosive waste, no documented hazardous waste occurs near the Salton Sea that would represent a significant risk to public health under the No Action Alternative. This assessment is based on the U.S. Navy's (U.S. Navy 1999, as cited in DWR and DFG 2007) position that all of the Installation and Restoration Program sites at the SSTB have been adequately investigated and closed with respect to hazardous waste. The potential for risk would be associated with the amount of disturbance in the soils.

It is assumed that use, storage, transport, and disposal of such materials would be in accordance with regulatory requirements.

The effectiveness of previous clearance activities for removing ordnance and explosive waste from the Salton Sea is uncertain. It is possible, but not documented, that remnant unexploded munitions remain buried in bottom sediments or shoreline areas of the Salton Sea, especially in areas near historically used bomb targets associated with the SSTB. The U.S. Navy is the lead Federal agency for the ordnance program at SSTB, and its goal is "full and continued protection of human health and the environment in a manner supporting the intended land use" (U.S. Navy 1999, as cited in DWR and DFG 2007).

Public Health

The public health issues considered in the analysis of the No Action Alternative are related to consumption of fish and wildlife tissue with high concentrations of contaminants (i.e. selenium, pesticides) and increased risk of mosquitoes and disease. Results from the screening-level human health risk assessments of fish and duck tissue consumption (i.e., maximum safe consumption rates) are discussed in Appendix G of the PEIR (DWR and DFG 2007). Selenium concentrations in fish fillet tissue from estuary habitats were 2.91 mg/kg wet weight (New River) and 3.4 mg/kg wet weight (Alamo River), which is below the OEHHA thresholds for FCG (7.4 mg/kg wet weight) and ATL (4.9-15 mg/kg wet weight). This results in a safe maximum fish consumption rate of up to 721 grams (Alamo River) and 842 grams (New River) per week. Another risk assessment examined four fish species recently sought by anglers at the Salton Sea (Moreau et al. 2007). Given a mean selenium concentration of 9.0 mg/kg wet weight in tilapia fillets, they concluded that weekly consumption of up to 1,000 grams of tilapia would not present any unacceptable risk for adverse health effects.

For selenium, the safe consumption rates of fish from the estuary habitats under the No Action Alternative are comparable to consumption rates under recent conditions, and indicate minimal risks to humans from selenium exposures under the No Action Alternative. For duck consumption under existing conditions, adults could consume from 23 to more than 60 meals per month of duck muscle from different habitats within the Salton Sea without exceeding the maximum consumption rates based on selenium exposures. For the No Action Alternative, maximum consumption rates range from about 14 to more than 100 meals per month for an adult and from 6 to more than 40 meals per month for a child. Similar to safe consumption rates estimated for fish, these large ranges in safe consumption rates for ducks are due to the high variability among the individual habitat types in the duck diet EPCs, which are, in turn, proportional to the sediment EPCs (DWR and DFG 2007, Appendix G).

For DDT and its derivatives, surface sediment concentrations at the Project Area (Table 3.10-5, Existing Conditions) and fish tissue DDT concentrations measured in the Salton Sea and the New and Alamo rivers are already at levels that represent a risk to human health, with health risks predicted to occur upon consumption of 10 grams per day or 4 meals per week of Salton Sea tilapia (see Section 3.10.3, Affected Environment). Under the No Action Alternative, accordance with OEHHA's public health advisory limiting fish consumption to two servings per week for all consumers (Table 3.10-4; OEHHA 2009) would result in minimal risks to humans from DDE exposure.

Under the No Action Alternative, the salinity of the Salton Sea would remain higher than 20,000 milligrams per liter (mg/L). Few mosquito species can survive in waters with salinity higher than 20,000 mg/L. However, some species, including larvae of the *Culex tarsalis* mosquito, which can be a vector for West Nile virus, are euryhaline (able to live in waters of a wide range of salinity) and can survive in higher salinity habitats. The receding shoreline would likely reduce the acreage of brackish marsh, which would reduce the amount of habitat suitable for mosquito populations. However, mosquitoes may occur in pupfish channels that would contain less saline water. The desert pupfish may eat the mosquitoes or other abatement measures may be required.

Mosquitoes also could breed in the sedimentation/distribution basins that would contain less saline water. Mosquitofish could be used to reduce mosquito populations in the basins.

Earth-moving operations would disturb soils that may contain coccidiomycosis spores, thereby increasing the potential for public health risks associated with valley fever. The risk of potential exposure would be greatest for construction workers and any members of the public within the immediate vicinity that are exposed to dust during the disturbance of 35,800 acres of land and use of 5,050,000 cubic yards of Seabed material. Disturbance also could cause release of ammonia, hydrogen sulfide, and methane.

There also could be a risk of injury to workers and recreationists due to unstable soils as the water recedes and the presence of extremely hot water near geothermal areas.

Under the No Action Alternative, the levels of waterborne bacteria in the Salton Sea are expected to decline due to implementation of the pathogen Total Maximum Daily Load and enforcement of source allocations on the New River.

3.10.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). During the construction phase of the SCH Project, hazardous materials proposed for use include solvents, gasoline, diesel fuel, motor oil, lubricants, and welding gases. No acutely hazardous materials would be used during construction, and none of the materials pose significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and their environmental mobility. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all very low volatility and represent limited off-site hazards. Any impact of spills or other releases of these materials would be limited to the site because of the small quantities involved and storage, handling and spill cleanup procedures. Best management practices, such as spill cleanup, secondary containment and proper storage and handling of hazardous materials during construction would be included as components of the Storm Water Pollution Prevention Plan.

Hazardous materials used during Project operation and maintenance would be lube oils for pumps and possibly small quantities of paints or solvents. These materials are of a very low toxicity and would be of such small volumes they are unlikely to trigger the Business Plan requirements for reporting and developing a Hazardous Material Management Plan. Therefore, handling, storage, usage and transportation of hazardous materials during construction and operation would be temporary and less-than-significant in comparison to both the existing setting and No Action Alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). Pesticides are known to be present in the sediments at the proposed site (Wang et al. 2011), and there is potential for worker exposure to these pesticides during construction. Compliance with the Imperial County Air Pollution Control District's Regulation VIII (Appendix G), which is mandatory, would reduce the potential for fugitive dust emissions at the construction site. This would also reduce the potential for worker exposure. Additionally, the period of exposure would be limited to the time that ground-disturbing activities were occurring, and the entire construction period would be limited to two years. This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

With the exception of pesticides, no significant areas of documented contamination were found in the Project area for Alternative 1, and no buildings, other structures, asphalts or concrete-paved surfaces areas would be demolished during Project construction. Soils would be tested for contaminants prior to excavation, and should testing show the presence of contaminated soil, or if such soil was observed either visually or through smell during construction activities, such material would be handled in accordance with appropriate methods. Any excavated areas that had an odor due to contaminated soil would be covered while one or more samples were being tested to determine the level of contamination. The presence of known or suspected contaminated soil or groundwater would require the supervision of testing and investigation by a licensed professional geologist or engineer, as appropriate to meet state and Federal regulations. The impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative because there would be no public exposure to, or release to the environment of hazardous materials or waste.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). As discussed in Section 3.4, Biological Resources, the Salton Sea ecosystem has become one of the most important habitats for birds in North America and supports some of the highest levels of avian biodiversity in the southwestern United States. The SCH would restore a portion of the habitat that will be lost as the Salton Sea recedes over time and as salinity levels increase. The ponds would be created as the Sea recedes and would replace habitat that was recently available and used extensively by birds. Birds presently tend to be concentrated near the shoreline. The ponds therefore are not expected to attract significantly greater concentrations of birds than currently use the area, and as the Sea recedes over time, it would constitute one of the few remaining areas that provide habitat for fish-eating birds. Bird populations are expected to decline at the Salton Sea regardless of whether the SCH Project is implemented. The Project would not increase the risk of bird airstrikes at civilian airports (the closest of which is approximately 8 miles from the proposed New River pond sites and therefore are too far to be affected by the SCH Project), nor would it increase risks for crop dusters flying over nearby fields because the number of birds in the Project area would not increase over current levels. The SCH Project would not increase risks for military aircraft using the MOAs because their floors begin at 30,000 feet and birds using the ponds would not be present at that altitude. The SCH Project also is not expected to increase risks for those pilots using the military training routes several times a year because these routes are located near the shoreline and the Sonny Bono Salton Sea National Wildlife Refuge, which already are heavily used by birds. Geese may roost or loaf in the proposed SCH ponds, but this would not be different than the existing condition. Based on the expected high salinity of the ponds and the lack of emergent vegetation, these species are not expected to forage in the proposed SCH ponds, nor would the ponds provide nesting habitat for these species, which otherwise could result in a larger population. Gulls and pelicans would use the ponds, but they are already present at the Sea, and over time, the number of birds in general at the Salton Sea would decline. Impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The Project would be located in a sparsely populated rural area. As discussed in Section 3.20, Transportation and Traffic, neither construction nor operations would result in an unacceptable level of service on any roadways, and the amount of traffic that would be generated on the generally lightly traveled local roadways would not delay emergency access. There is a potential for brackish water pipeline installation to occur along existing roadways, but typical roadway safety precautions would be taken (e.g., flaggers, signs warning motorists of roadway work), and at least one travel lane would remain open at all times, thereby ensuring that emergency vehicles and those of the general public could pass. Finally, because emergency vehicles are equipped with sirens, which give advance warning of their approach, construction crews would have the ability to make emergency provisions for safe vehicle passage through construction zones. Impacts therefore would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). Potential sources of ignition include equipment with internal combustion engines, gasoline-powered tools, and equipment or tools that produce a spark, fire, or flame. Such sources include sparks from blades or other metal parts scraping against rock, overheated brakes on wheeled equipment, friction from worn or unaligned belts and drive chains, and burned-out bearings or bushings. Smoking by onsite construction personnel is also a source of ignition during construction. There are no “Very-High Fire Hazard Severity Zone” or “Wildland Area that may Contain Substantial Forest Fire Risk and Hazard” designations within the study area (Imperial County Fire Hazard Map). Although the use of construction could pose a wildland fire risk, the risk is less than significant when compared to both the existing environmental setting and the No Action Alternative due to lack of a source of fuel for wildland fires in

the Project area and because regulations requiring fire suppression equipment would be followed. The impact would occur during construction and is therefore temporary and short-term.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). Construction for Alternative 1 would require excavation for the ponds, brackish water pipelines, and a sedimentation basin. Construction would take place out of doors, and rodent handling would not occur; therefore, exposure to the Hantavirus is unlikely. Earth-moving activities during construction could release air and dust-borne diseases such as valley fever into the air exposing workers; given required dust control measures (refer to Section 3.3, Air Quality and Appendix G1, Imperial County Air Pollution Control District, Regulation VIII, Fugitive Dust Control Measures), impacts would be localized and would not be expected to affect the general public. The impact on workers would be significant.

Mitigation Measures

MM HAZ-1: Worker training will be provided to workers who may be exposed to air-borne diseases during excavation activities. Training will include recognizing symptoms and use of personal protective equipment.

Residual Impact

Implementation of MM HAZ-1 would reduce Impact HAZ-6 to less than significant because workers would be trained how to recognize symptoms (and thus get treatment) as well as how to use personal protective equipment to prevent disease.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). It is expected that the SCH ponds would not be conducive to mosquito production because the configuration of the ponds includes a large proportion of the surface area with open water at a depth less than 2 feet. Open water should reduce the survival of immature mosquitoes because of disturbance and drowning caused by wind-driven waves and high susceptibility to predators. The SCH ponds at the high end of the range of operational salinities are predicted to be too salty for significant mosquito production and colonization by wetland plants. If mosquito production occurs in the SCH ponds, it is likely to be limited to the shallow zones of the upslope periphery of the pond and maybe the berms, if aquatic vegetation and/or inundated grasses (i.e., *Distichlis*) colonize the shallow water and berms. The width of this area may be only 3 feet to 6 feet (1 to 2 meters) which represents only 0.6-1.1 percent of the surface area of a 100-acre pond. If vegetation is found along the periphery of the sedimentation pond, then monitoring for larval mosquito populations would occur at natural openings in vegetation.

The ponds would be managed at a salinity ranging from 20 parts per thousand (ppt) to 40 ppt, which would reduce the potential for vegetation to grow in the ponds because the higher salinities exceed the tolerances of most freshwater macrophytes. Salinities at the lower end of the management range, however, may not limit macrophyte colonization (refer to Appendix F for additional information regarding the potential for mosquitoes to survive in salinities up to 70 percent (24.5 ppt) of full-strength sea water). Vegetation management in the low salinity ponds may be required to reduce or eliminate conditions conducive to mosquito production. A Mosquito Control Plan (Appendix F) has been developed for the SCH Project and its implementation would minimize the potential for public safety risks from the presence of mosquitoes. It would involve monitoring mosquito populations, the surveillance of mosquito-borne pathogens that cause diseases in human and wildlife, and the implementation of a treatment program to control mosquitoes at the SCH ponds and sedimentation basins at the outflows of the New River or Alamo River into the Salton Sea, if needed. Monitoring activities would be used to locate

mosquito life stages (larvae, pupae, and adults), estimate their abundance, and determine species composition for the purpose of making treatment decisions. Disease surveillance would be used to detect the presence of mosquito-borne disease as part of a state-wide program. Mosquito treatments would be used to reduce the abundance of mosquito populations and associated mosquito-borne disease risk, as needed. Given the implementation of this plan, impacts would be less than significant when compared to both the existing environmental conditions and the No Action Alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). Operation of the SCH ponds would require blending of New River water and Salton Sea water. Potential selenium concentrations in fish tissue were estimated for the proposed alternatives and two operating scenarios using a selenium ecorisk model (Sickman et al. 2011).

Estimates of fish muscle selenium concentrations for Alternative 1 were 1.1-1.4 mg-kg-wet weight (Table 3.10-7). These concentrations are well below the OEHHA thresholds for FCG (7.4 mg/kg wet weight) and ATL (4.9-15 mg/kg wet weight), and within the range determined to be safe for expected human consumption (DFG and DWR 2007, Appendix G). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Table 3.10-7 Predicted Selenium Concentrations in Whole Fish Tissue at New and Alamo River Sites under Varying Salinity Ranges

River Source	Salinity (ppt)	Fish (whole, mg/kg dry weight)	Fish (muscle tissue fillet, mg/kg wet weight)
New River (Alternatives 1, 2, and 3)	20 ppt	5.5	1.4
	35 ppt	4.3	1.1
Alamo River (Alternatives 4, 5, and 6)	20 ppt	8.5	2.2
	35 ppt	5.9	1.5

Source: Modeled selenium concentrations of whole fish (dry weight) from Sickman et al. 2011, converted to selenium concentrations in muscle tissue (wet weight) based on conversion factors in DWR and DFG 2007, Appendix G.

Selenium concentration in duck tissue was not estimated in the current ecorisk model. Waterfowl that use the SCH ponds could have higher selenium concentrations than waterfowl taken at typical hunting areas, which are supplied by Colorado River water. However, waterfowl typically move among foraging areas and, therefore, any potential dietary intake at the SCH ponds would be partially offset and diluted by intake from other areas. The risk of human exposure would depend on whether hunters would encounter, hunt, and consume those birds using the ponds. The deep open water SCH ponds would favor diving ducks (e.g., ruddy ducks) over dabbling duck species (e.g., mallards, teal). Dabbling ducks and geese are preferred species for consumption, and they are more often associated with managed wetland habitats (e.g., duck clubs, the Sonny Bono Salton Sea National Wildlife Refuge, and Imperial Wildlife Area). The ponds would not contain vegetation that would serve as cover for the dabbling duck species, and the ponds would not be managed to attract these species. Although some hunting could be allowed at the ponds, they would likely be less desirable hunting locations than other nearby sites, and it is not likely that the increased selenium concentration would adversely affect public health. To provide additional context, for the alternatives considered in the PEIR, which included Early Start Habitat similar to the SCH Project, the reference maximum duck meal consumption rates for the alternatives typically were greater than 20 meals per month for an adult, with the exception of the slightly lower rates associated with the

Marine Sea habitats of Alternatives 5 and 6 (16 and 19 meals per month, respectively) (DWR and DFG 2007). Maximum safe consumption rates for children ranged from about 6 to more than 30 meals per month for various alternative and habitat combinations. Impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Sediment DDE concentrations (Wang et al. 2011) and fish tissue DDT concentrations (CRBRWQCB 2002b; Costa-Pierce et al. 2000) measured in the New River are already at levels that represent a potential risk to human health. Because DDT and its metabolites bind to the sediments, disturbance and re-wetting of sediments during SCH pond construction would result in increased exposure of aquatic organisms, birds, and humans. Under Alternative 1, the estimated sediment DDE concentrations (Table 3.10-5) would exceed the SLVs for the general population and more frequent consumers (Poulsen and Peterson 2006). However, the calculated DDE sediment concentrations would be very similar to existing conditions for that playa area, suggesting that the impacts of DDE exposure from Alternative 1 on human health would be less than significant when compared to the existing environmental setting and the No Action Alternative.

3.10.4.5 Alternative 2 – New River, Pumped Diversion

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased contaminant levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.10.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.10.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative. The brackish water pipeline that would be constructed under this alternative would avoid the CalEnergy site and thus would not be exposed to hazardous materials present at this site.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion of selenium under Alternative 1 is applicable to this alternative, with the exception that the habitat ponds would be supplied with Alamo River water. The Alamo River has higher dissolved selenium levels than the Salton Sea or New River. Modeled estimates of fish muscle selenium concentrations were 1.5 - 2.2 mg/kg wet weight (Table 3.11-7) (Sickman et al. 2011). These modeled concentrations are well below the OEHHA thresholds for FCG (7.4 mg/kg wet weight) and ATL (4.9-15 mg/kg wet weight), and within the range determined to be safe for expected human consumption (DFG and DWR 2007, Appendix G). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

For DDE, the discussion under Alternative 1 is applicable to this alternative, with the exception that ponds would be constructed at Morton Bay beside the Alamo River. DDE concentrations measured in the Alamo River are already at levels that represent a potential risk to human health, both for fish tissue (Costa-Pierce et al. 2000; CRBRWQCB 2002a), and for sediment (Table 3.10-5) based on sediment SLVs (Poulsen and Peterson 2006). The highest sediment DDE concentration documented at both rivers was at Morton Bay (102 ng/g subsurface, Wang et al. 2011). Therefore, the estimated sediment DDE concentrations calculated from that maximum value (which represents a hypothetical maximum exposure) are particularly high when compared to the maximum documented surface value at this site (Table 3.10-5). Given this consideration, the impact of DDE exposure on human health would be less than significant when compared to the existing environmental setting and the No Action Alternative.

3.10.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion under Alternative 4 is applicable to this alternative.

3.10.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact HAZ-1: Hazardous materials used during construction could be released into the environment (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-2: Project construction could encounter contaminated soils during soil excavation (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-3: The ponds would attract birds in proximity to low-level military training routes (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-4: Increased traffic and construction near roadways would not impair the implementation of an adopted emergency response or evacuation plan (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-5: Project construction could increase the risk of wildland fire (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-6: Project construction could release air and dust-borne disease causing viruses (significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-7: Project operation could increase breeding habitat for mosquito vectors but implementation of the Mosquito Control Plan would present threats to public health (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HAZ-8: Selenium and DDE levels in the SCH ponds could cause increased selenium and DDE levels in sport fish and waterfowl using the ponds (less-than-significant impact). The discussion under Alternative 4 is applicable to this alternative.

3.10.5 References

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3.11 HYDROLOGY AND WATER QUALITY

3.11.1 Introduction

This section addresses the hydrology and water quality of the Salton Sea, the New River, the Alamo River, and groundwater underlying the Salton Sea Basin. Water quality impacts on biological resources are discussed in Section 3.4, Biological Resources. Impacts on fugitive dust emissions resulting from changes in the water surface elevation of the Sea are discussed in Section 3.3, Air Quality. The study area for hydrology and water quality is the Salton Sea watershed, shown on Figure 3.11-1.

Table 3.11-1 summarizes the impacts of the six Project alternatives on hydrology and water quality, compared to both the existing conditions and the No Action Alternative.

Table 3.11-1 Summary of Impacts on Hydrology and Water Quality

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact HYD-1: Project implementation would cause a reduction in the Salton Sea's water surface elevation.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HYD-2: Project implementation would increase the Salton Sea's salinity.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HYD-3: Project operations would cause changes in Salton Sea water quality but would not violate established standards.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HYD-4: Construction of the SCH ponds would temporarily degrade water quality at the Salton Sea.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact HYD-5: Berm failure could increase erosion and sedimentation of the adjacent river and the Salton Sea.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

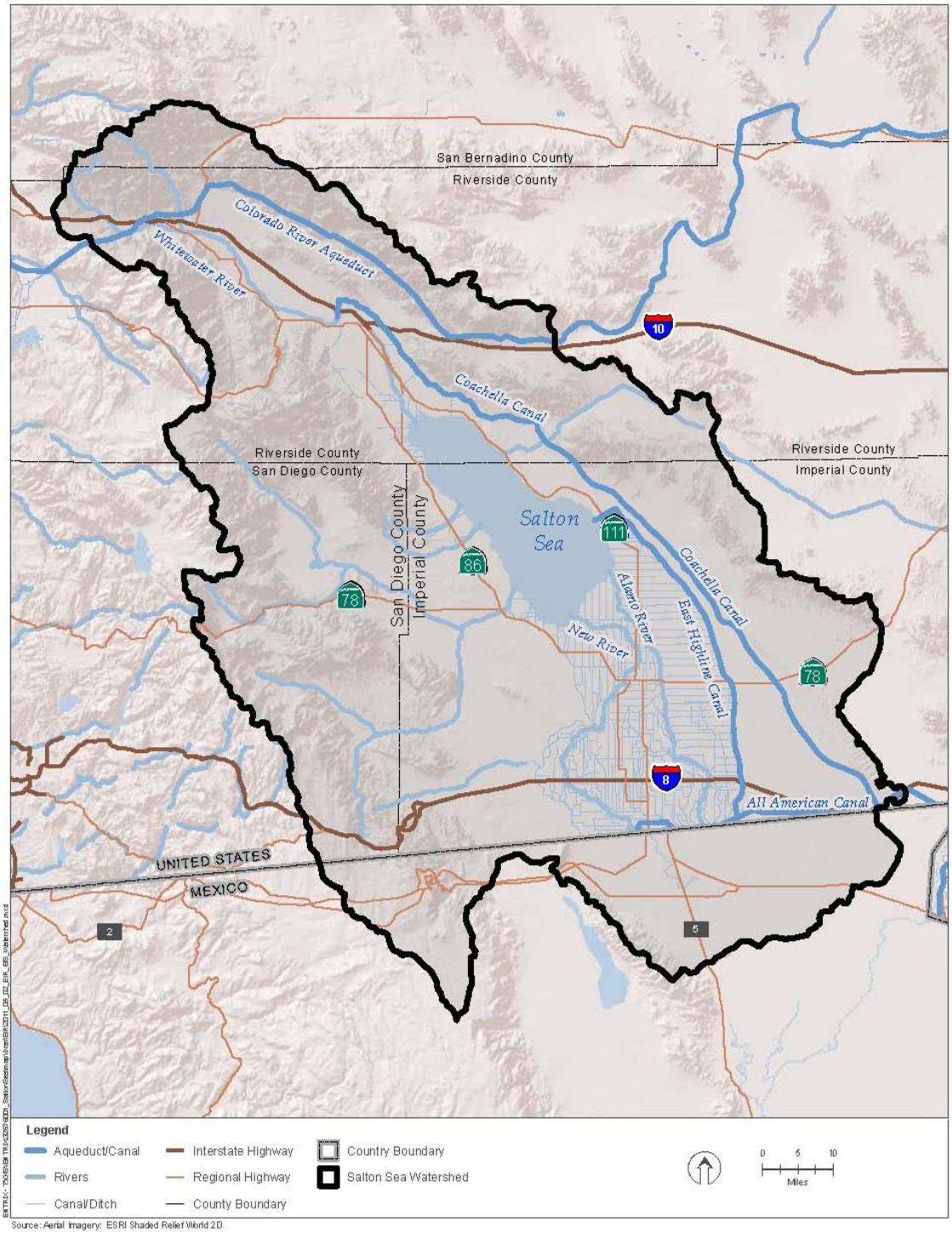


Figure 3.11-1 Salton Sea Contributing Watershed

3.11.2 Regulatory Requirements

3.11.2.1 Water Rights

Individuals and agencies in the Salton Sea Basin hold seven individual water rights permits for diversion from Salton Sea tributaries. Imperial Irrigation District (IID) has water rights on the Colorado River for delivery of water through the All American Canal. Metropolitan Water District of Southern California has submitted a water right application to divert agricultural return flows from the New and Alamo rivers. The return flows are a result of the application of Colorado River water to irrigated lands in IID's service area. The New River water right application seeks 700 cfs up to a maximum of 433,400 afy. The Alamo River water right application is for a diversion of 800 cubic feet per second (cfs) up to 475,000 acre-feet per year (afy). To date, Metropolitan Water District of Southern California has not prepared the required environmental document for these water rights permits and so the California State Water Resources Control Board (SWRCB) has not acted upon these permits.

3.11.2.2 Salton Sea and Agricultural Drainage

The Salton Sea receives runoff from several small tributaries, in addition to the Whitewater, New, and Alamo rivers. Flows from the three rivers are largely the result of agricultural return flows. The application of irrigation water introduces salts to the land, which are leached through the soil and collected in subsurface drains located 4 to 6 feet below the surface. This water is then conveyed to surface drains connected directly to the Salton Sea, or to the New or Alamo rivers and then to the Sea.

The California Legislature in 1968 passed Assembly Bill 461 that reserves the Salton Sea for collection of agricultural drainage flows, seepage, and other flows.

3.11.2.3 Federal Water Quality Regulations

Federal Water Pollution Control Act Amendments of 1972 (Clean Water Act)

The Federal Water Pollution Control Act Amendments of 1972, also known as the Clean Water Act, established the institutional structure for the United States Environmental Protection Agency (USEPA) to regulate discharges of pollutants into the Waters of the United States, establish water quality standards, conduct planning studies, and provide funding for specific grant projects. Congress has amended the Clean Water Act several times since 1972. USEPA has provided most states with the authority to administer many of the Clean Water Act's provisions. In California, the SWRCB has been designated by USEPA along with the nine Regional Water Quality Control Boards (RWQCB) to develop and enforce water quality objectives and implementation plans, as described below under Section 3.11.2.4, State Surface Water and Water Quality Regulations. The Colorado River Basin RWQCB (CRBRWQCB) is the lead water quality management agency in the study area (California Department of Water Resources [DWR] and California Department of Fish and Game [DFG] 2007).

Clean Water Act section 401 requires that Federally authorized discharges into Waters of the United States not violate state water quality standards. Clean Water Act section 402 authorizes states to issue National Pollutant Discharge Elimination System (NPDES) permits for discharges to surface water both from point sources and many nonpoint sources in stormwater. Compliance is required for all discharges into Waters of the United States, or for construction projects that would disturb 1 acre or more. The CRBRWQCB administers the NPDES permit program in the study area, except on Tribal lands (DWR and DFG 2007).

Clean Water Act section 404 requires that an entity obtain permits before discharging dredge or fill material into navigable waters, their tributaries, and associated wetlands. Activities regulated by section

404 permits include, but are not limited to, dredging, bridge construction, flood control actions, and some fishing operations (DWR and DFG 2007).

Under Clean Water Act section 303(d), states, territories, and authorized Indian tribes submit lists to the USEPA describing water bodies for which existing pollution controls are insufficient to attain or maintain water quality standards. Impaired water bodies must be ranked based upon the severity of the pollution and the beneficial uses of such waters. After submitting the list of impaired waters, also referred to as a 303(d) list, states must develop a plan, called the Total Maximum Daily Load (TMDL) plan, to limit excess pollution loading to the waterbody. A TMDL represents the greatest pollutant load that a waterbody can assimilate and continue to meet water quality standards and designated beneficial uses. Generally, TMDLs are adopted for specific pollutants throughout the water body (DWR and DFG 2007).

The California Environmental Protection Agency, SWRCB, and CRBRWQCB have identified water bodies within the Salton Sea watershed that do not comply with applicable water quality standards. The Salton Sea and all of the principal inflow sources are listed as impaired water bodies (DWR and DFG 2007).

A number of TMDLs have been adopted for the Salton Sea watershed and approved by the SWRCB and USEPA. They include sedimentation/siltation TMDLs for the New and Alamo rivers, organic enrichment/low dissolved oxygen, pathogen, and trash TMDLs for the New River, and a selenium TMDL for the Imperial Valley Drains (CRBRWQCB 2010a). Other TMDLs are in the development and review processes, as shown in Table 3.11-2.

Table 3.11-2 Impaired Water Bodies within the Salton Sea Watershed

Water Body	Pollutant/Stressor
New River	Chlordane, Chlorpyrifos, Copper, DDT, Diazinon, Dieldrin, Hexachlorobenzene, Mercury, Nutrients[1], Organic Enrichment/Low Dissolved Oxygen, PCBs, Pathogens, Sedimentation/Siltation[2], Selenium, Toxaphene, Toxicity, Trash, Zinc
Alamo River	Chlordane, Chlorpyrifos, Dichlorodiphenyltrichloroethane (DDT), Diazinon, Dieldrin, Endosulfan, Enterococcus, Escherichia coli (E.coli), Mercury, Polychlorinated biphenyls (PCBs), Sedimentation/Siltation2, Selenium, Toxaphene
Imperial Valley Drains	Chlordane, DDT, Dieldrin, Endosulfan, PCBs, Sedimentation/Siltation2, Selenium, Toxaphene
Salton Sea	Arsenic, Chlorpyrifos, DDT, Enterococcus, Nutrients, Salinity[3], Selenium

Notes:

[1] CRBRWQCB (2010a) proposes to establish a TMDL in cooperation with USEPA and Mexico.

[2] Sedimentation/Siltation TMDL for Alamo River (CRBRQCB 2002a), New River (CRBRWQCB 2002b) and Imperial Valley Drains (CRBRWQCB 2005)

[3] TMDL development will not be effective in addressing this problem, which will require an engineering solution with Federal, local, and state cooperation (CRBRWQCB 2010a).

3.11.2.4 State Surface Water and Water Quality Regulations

California Fish and Game Code section 1602 requires an entity to consult with DFG prior to diverting, obstructing, or changing natural flow of a bed, channel, or bank of a river, stream, or lake; or using materials from the streambed; or disposing of materials in a river, stream, or lake. If the action would

adversely affect fish and wildlife resources, DFG would require a Lake and Streambed Alteration Agreement.

DWR's Division of Safety of Dams (DSOD), which operates under California Water Code Division 3, reviews plans and specifications for the construction of new dams or for the enlargement, alteration, repair, or removal of existing dams. DSOD must grant written approval before construction can proceed on any new dam (assuming it falls within DSOD's jurisdiction). The berms proposed for the Species Conservation Habitat (SCH) Project would be constructed using local materials and impound water that is no more than 6 feet from the water surface to the berm's downstream toe. This design consideration places the berms outside the DSOD's jurisdiction (personal communication, D. Gutierrez 2011).

Porter-Cologne Act

The Porter-Cologne Act modified the California Water Code to establish the responsibilities and authorities of the SWRCB and nine RWQCBs. The SWRCB formulates and adopts state policy for water quality control. The RWQCBs develop water quality objectives and Basin Plans that identify beneficial uses of water, establish water quality objectives (limits or levels of water constituents based on Federal and state laws), and define implementation programs to meet water quality objectives (DWR and DFG 2007).

Colorado River Basin Regional Water Quality Control Board Water Quality Control Plan

The CRBRWQCB Water Quality Control Plan establishes water quality criteria and guidelines that protect human and aquatic life uses of the Lower Colorado River geographic subregion. Specifically, the Water Quality Control Plan designates beneficial uses for surface water and groundwater, establishes narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses, conforms to California's antidegradation policy, describes implementation programs to protect the beneficial uses, and defines required monitoring activities to evaluate the effectiveness of the Water Quality Control Plan (DWR and DFG 2007).

Additionally, the Water Quality Control Plan (CRBRWQCB 2006) incorporates, by reference, all applicable SWRCB and CRBRWQCB plans and policies.

Beneficial uses designated for the New and Alamo rivers in the Project area and the Salton Sea are summarized in Table 3.11-3.

Table 3.11-3 Designated Beneficial Uses for Surface Waters in the SCH Project Area

Beneficial Use	Description	Surface Water		
		New River	Alamo River	Salton Sea
Aquaculture (AQUA)	Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.			X
Freshwater Replenishment (FRSH)	Uses of water for natural or artificial maintenance of surface water quantity or quality.	X	X	
Industrial Service Supply (IND)	Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.	P		P

Table 3.11-3 Designated Beneficial Uses for Surface Waters in the SCH Project Area

Beneficial Use	Description	Surface Water		
		New River	Alamo River	Salton Sea
Water Contact Recreation (REC-I)	Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, and use of natural hot springs.	X[1]	X[2]	X
Noncontact Recreation (REC-II)	Uses of water for recreational activities involving proximity to water, but not normally involving contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.	X	X	X
Warm Freshwater Habitat (WARM)	Uses of water that support warmwater ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.	X	X	X
Wildlife Habitat (WILD)	Uses of water that support terrestrial ecosystems including, but not limited to, the preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.	X	X	X
Hydropower Generation (POW)	Uses of water for hydropower generation.		P	
Preservation of Rare, Threatened, or Endangered Species (RARE)	Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or Federal law as rare, threatened, or endangered.	X[3]	X[3]	X[3]

Notes:

1 Although some fishing occurs in the downstream reaches, the presently contaminated water in the river makes it unfit for any recreational use. An advisory has been issued by Imperial County Health Department warning against the consumption of any fish caught from the river and the river has been posted with advisories against any body contact with the water.

2 The only REC I usage that is known to occur is from infrequent fishing activity.

3 Rare, endangered, or threatened wildlife exists in or utilizes some of these waterway(s). If the RARE beneficial use may be affected by a water quality control decision, responsibility for substantiation of the existence of rare, endangered, or threatened species on a case-by-case basis is upon DFG on its own initiative and/or at the request of the CRBRWQCB; and such substantiation must be provided within a reasonable time frame as approved by the CRBRWQCB.

X = existing use; P = potential use

Source: CRBRWQCB 2006

3.11.2.5 Surface Water Hydrology

Salton Sea

The Salton Sea is located in the Salton Trough, a northern extension of the Colorado River Delta. The Sea's bottom elevation is about 278 feet below msl, and the water surface elevation on October 1, 2010 (the start of the 2011 water year), was -231.87 feet msl (United States Geological Survey [USGS] 2010).

The Sea's total volume is approximately 7.2 million acre-feet (af), with a current maximum depth of 46 feet. With about 350 square miles of surface area, the Salton Sea is the largest waterbody in California. It measures about 35 miles along a northwest/southeast axis by about 15 miles at its widest point. The total shoreline measures about 120 miles (DWR and DFG 2007).

The Salton Sea is a terminal water body that receives water from the New, Alamo, and Whitewater rivers, along with numerous small streams, precipitation, and groundwater. The only outflow from the Sea is through evaporation and seepage. Formed in 1905–1907 from Colorado River flood flows, the Salton Sea is supported primarily by agricultural return flows. These return flows have decreased in recent time, largely because of water transfers from the Imperial Valley and the resulting water conservation measures. Recent Salton Sea elevations show the elevation peak around May 1995 and a decreasing trend to the end of the 2010 water year (Figure 3.11-2). Inflow to the Sea from the Imperial Valley is projected to continue to decline from the current annual average of 1,029,620 afy to 723,940 afy (with adjustment for the Quantification Settlement Agreement [QSA]) by 2020 (DWR and DFG 2007). The combined inflow from the Imperial Valley and Mexico to the Salton Sea represents about 86.3 percent of the total inflow to the Sea. The Coachella Valley accounts for 8.5 percent of the total inflow to the Sea. The total salt loading to the Sea from these sources is 92.6 and 5.8 percent, respectively (DWR and DFG 2007). The relative magnitude of the annual flow to the Sea from the three major tributaries is shown on Figure 3.11-3.

Wastewater discharges enter the Salton Sea from numerous municipal wastewater systems in the Imperial and Coachella valleys. The wastewater effluent is discharged to the New River, Alamo River, or Coachella Valley Stormwater Channel, and eventually flows to the Sea. In the future, the wastewater effluent is expected to decline as more water is recycled and overall municipal wastewater flows decrease because of water conservation measures.

New River

The New River originates in the Mexicali Valley of northern Mexico and terminates where it flows into the Salton Sea. It receives runoff from several sources, primarily agricultural drainage conveyed to the river by subsurface drains, as well as wastewater treatment plant flows. The New River watershed is predominantly at or below sea level. Rainfall in the Imperial Valley is less than 2 inches annually, but the New River receives up to 10 inches each year in the southwestern portion of the watershed located in northern Mexico (Hely and Peck 1964).

The New River flow is measured at a gage near Westmorland (USGS gage #10255550) and at the international boundary with Mexico (USGS gage #10254970). The annual flow (based on water year) for water years 1944–2010 at the Westmorland gage has ranged from 360,459 af to 536,100 af, with an average of 443,272 af (Figure 3.11-4). Both IID and USGS measured the New River flow independently prior to March 2005. Since that time, both agencies have cooperatively collected streamflow data for the river. Daily flow data at the USGS stream flow gage near Westmorland indicate that the flows from 1944 to date show a median flow for each month that ranges from 521 cfs (December) to 732 cfs (April). The 90 percentile flow (90 percent of all flows are greater) is 423 cfs (December) while the minimum 10 percentile flow (only 10 percent of flow is greater) is 848 cfs (April) (Table 3.11-4 and Figure 3.11-4). The range in any month between the 10 and 90 percentile ranges from 200 cfs to 240 cfs. The USGS rates the measurement capability of stream gages on a system that ranges from "Poor" to "Good" that relates to the accuracy of the streamflow measurements. The Westmorland gage provides data rated "Good" for 74 percent of its history.

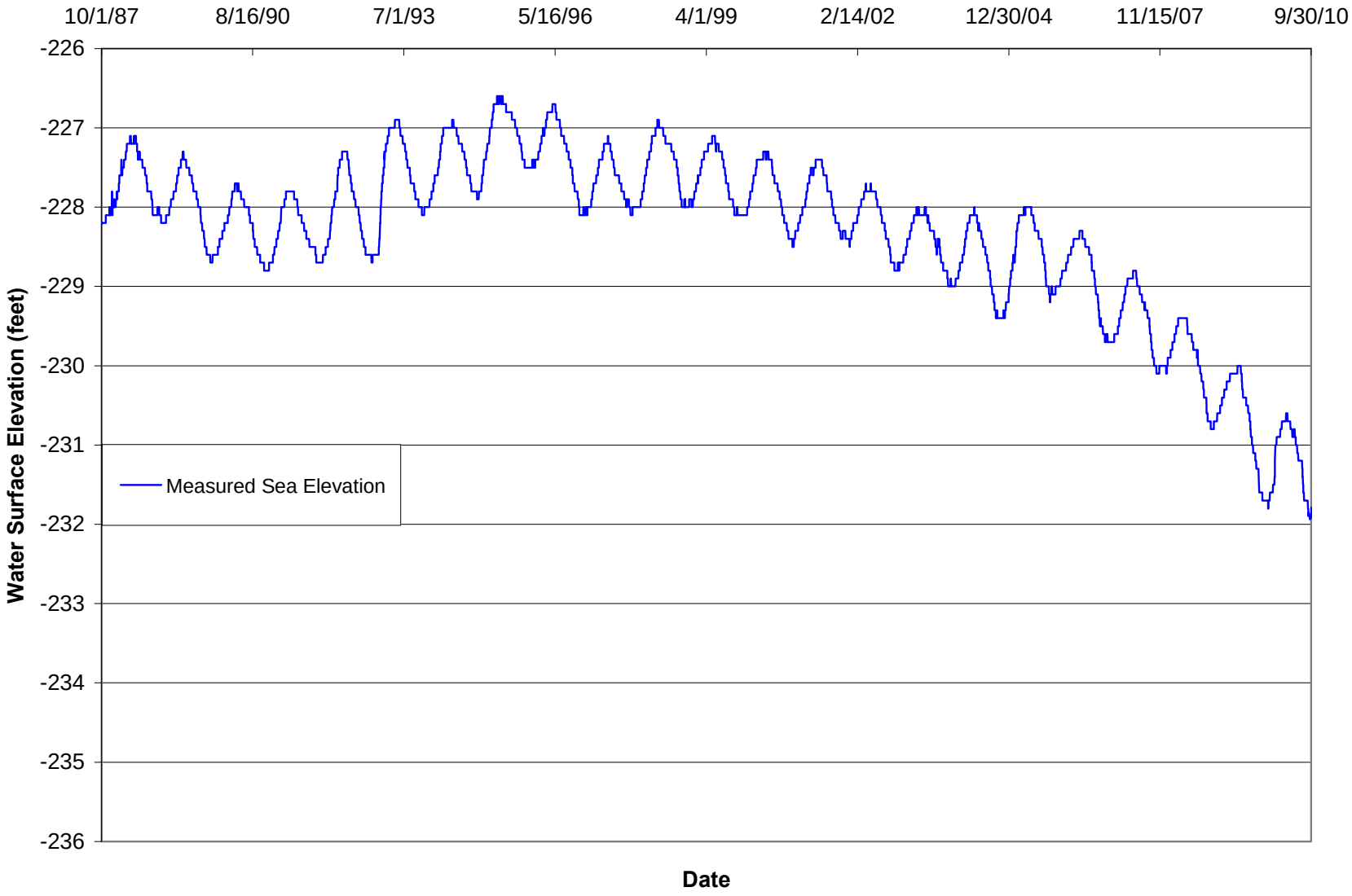


Figure 3.11-2 Salton Sea Water Surface Elevation

Source: USGS data for Station #10254005 Salton Sea near Westmorland

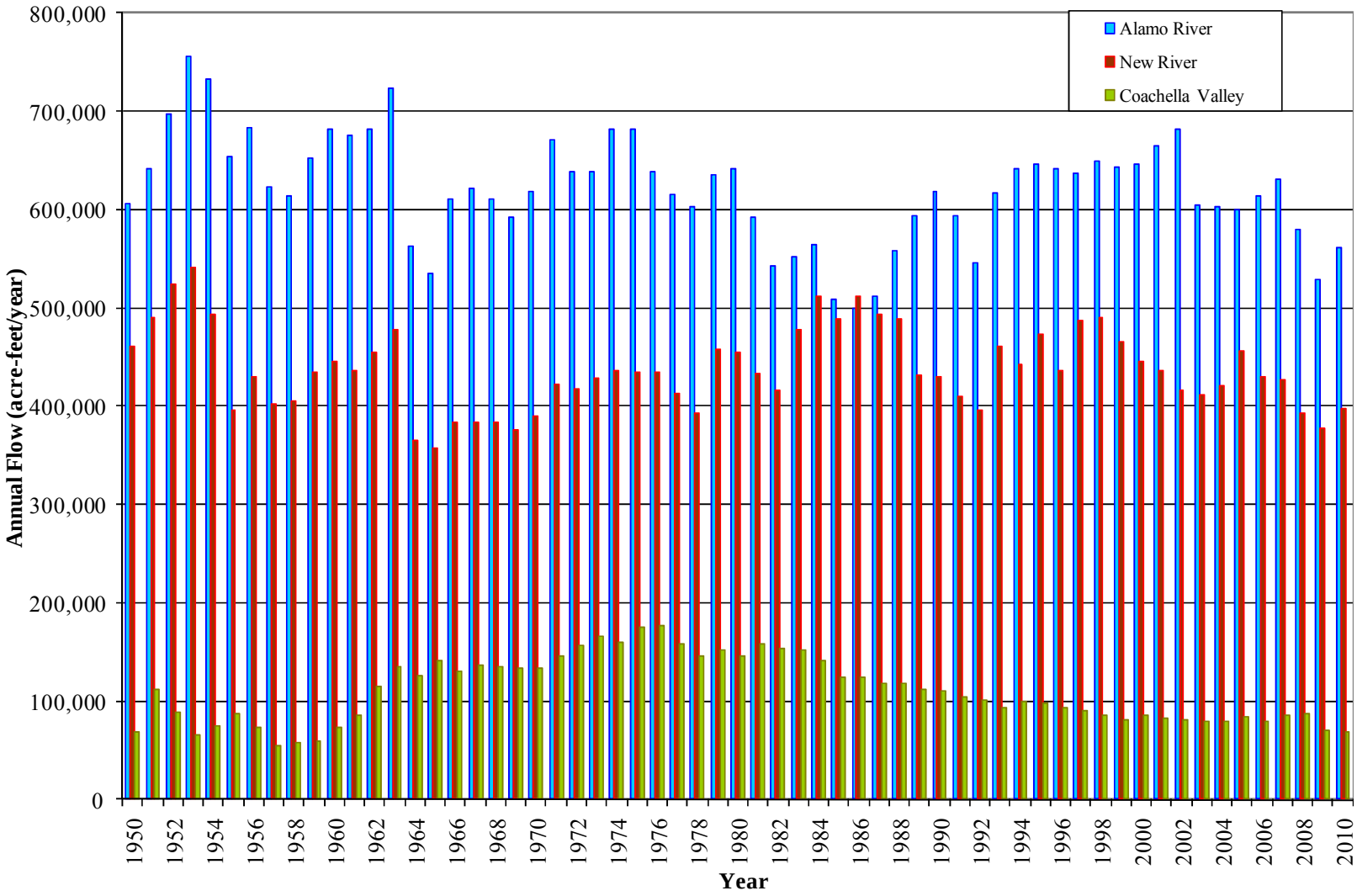


Figure 3.11-3 Annual Flow for the Primary Watercourses Tributary to the Salton Sea

Source: USGS gage #10255550, USGS gage #10254, USGS gage #10259540, CVWD Data

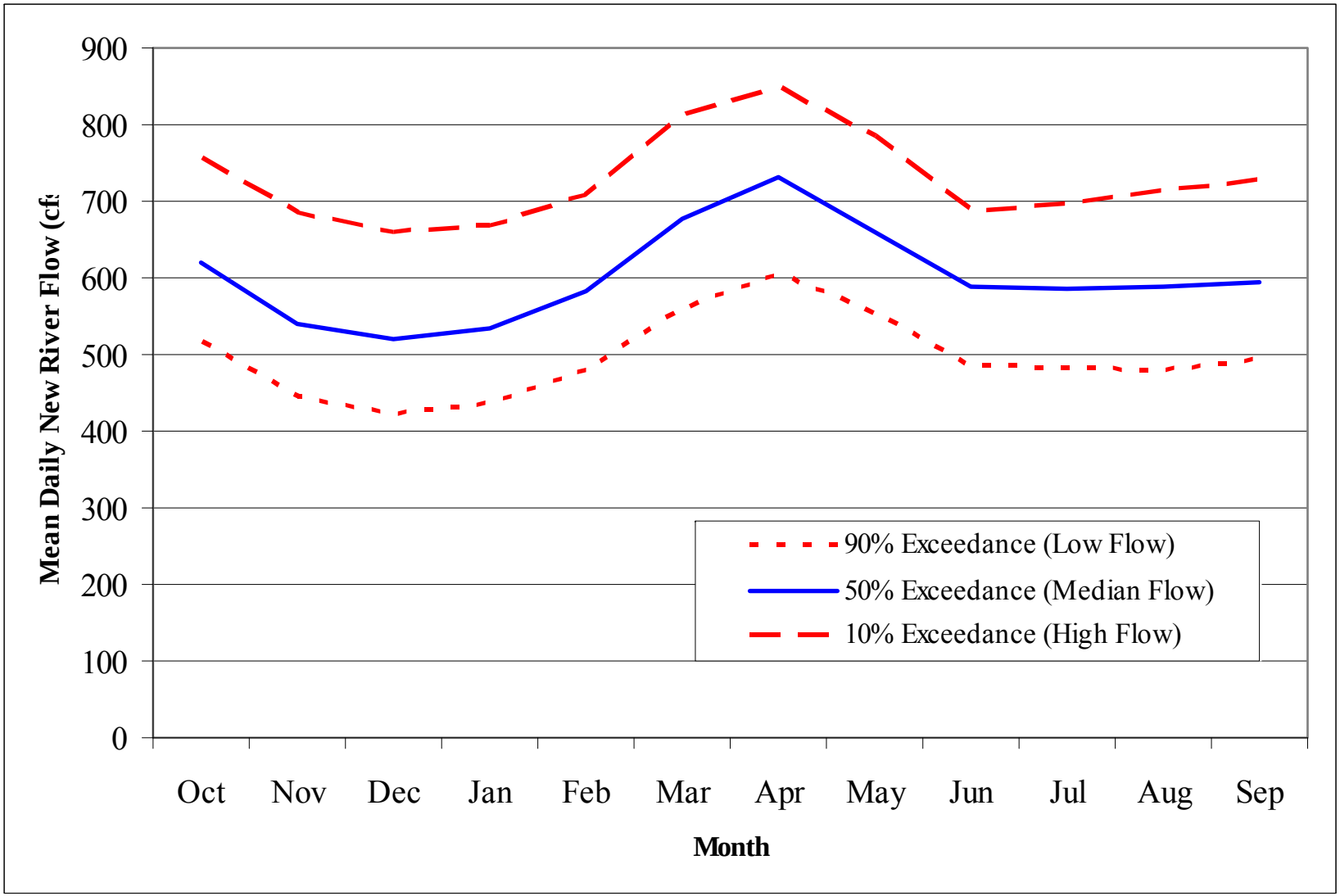


Figure 3.11-4 New River Exceedance Plot of Average Daily Flows

Alamo River

The Alamo River also originates in the Mexicali Valley and flows north to the Salton Sea. Runoff from the Chocolate Mountains to the southeast contributes to the Alamo River through numerous watercourses that eventually are picked up in agricultural drains within IID's service area. Along its course, the river picks up stormwater, municipal wastewater, and agricultural return flows. During dry periods, the river flow is composed almost entirely of agricultural return flow (drainwater). The elevation of this basin is primarily at or below sea level, with a mean annual precipitation less than 2 inches near the Salton Sea.

The flow of the Alamo River into the Salton Sea is measured at the USGS stream flow gage near Niland (USGS gage #10254730) and upstream near Calipatria (USGS gage #10254670). Prior to October 1, 2004, IID and USGS independently collected Alamo River flow data. While the measurements were similar, differences often occurred in the measured value (DWR and DFG 2007). Currently, the flow data are cooperatively collected at Niland and only one dataset is used. The Niland gage provides measurements rated "Good" for 93 percent of its history, while the Calipatria gage provides measurements rated "Good" for 65 percent of its history.

The USGS data at Niland indicate that the annual flow for water years 1960–2010 ranged from 492,315 af to 717,375 af, with an average of 612,274 af (Figure 3.11-5). Median monthly flows ranged from 630 cfs in January to 1,100 cfs in April. January and February typically experience the lowest daily flow and April experiences the highest (Table 3.11-4). Variation of flow within a month occurs in response to irrigation practices as well as occasional storm events. For December/January, the minimum flow month, 90 percent of the flows are greater than 443 cfs (the "90 percentile" value). During April, the high flow month, 10 percent of the daily flows exceed 1,240 cfs (the "10 percentile" value). For any given month, the historic record suggests that the variation between the 10 percent and 90 percent exceedance flow ranges from 300-400 cfs (Figure 3.11-5).

Agricultural Drains/Natural Watercourses

IID is the agricultural water purveyor in the Imperial Valley, providing water from the Colorado River through the All American Canal. IID receives and delivers about 90 percent of the 3.2 million af of irrigation water delivered from the Colorado River (Lawrence Livermore National Laboratory [LLNL] 2008). IID also provides a network of drainage channels that receive water from on-farm subsurface drainage systems (Figure 3.11-6). This drainage water is then conveyed to the New River, Alamo River, or directly to the Salton Sea. Agricultural drainage from the Imperial Valley to the Sea comprises about 10 percent of total Imperial Valley contribution to the Sea's inflow, which is estimated at 93,848 afy (DWR and DFG 2007).

Several natural watercourses terminate at the Salton Sea, including in the Project area. Several watercourses begin southwest of the New River, cross under State Route 86 and the Westside Canal before entering the Salton Sea. These watercourses typically convey runoff only during large rainfall events. These storms produce high peak flow and short duration floods. The runoff west of State Route 86 is collected with levees near the highway and directed under the highway and the canal. Runoff is then conveyed in natural and constructed channels to the Salton Sea. To the southeast, several watercourses cross the Coachella Canal and Highline Canal and enter IID's drainage system. Flow records are not available for these natural watercourses, but the flows are irregular, only responding to large thundershower events.

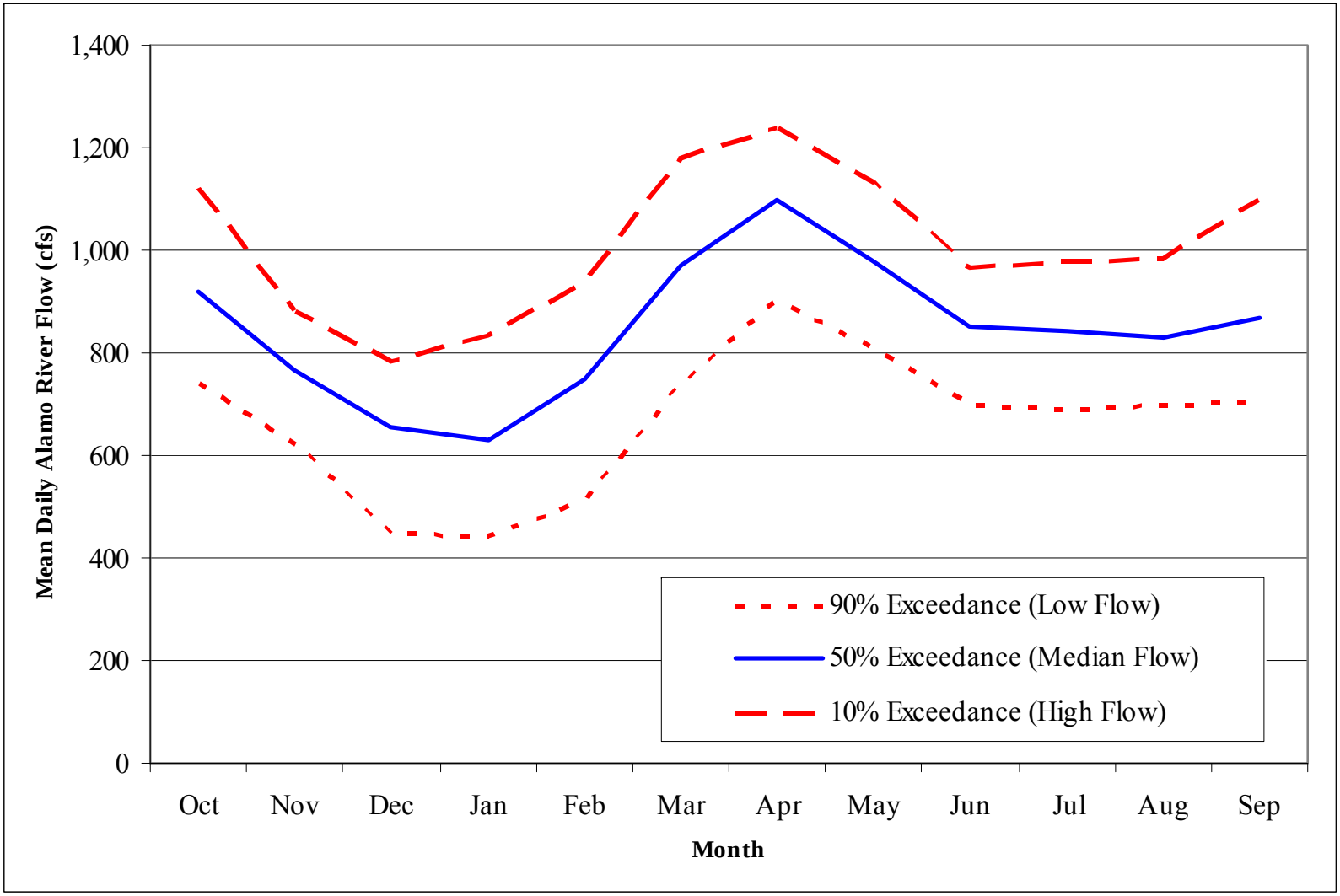


Figure 3.11-5 Alamo River Exceedance Plot of Average Daily Flows

Table 3.11-4 Statistical Representation of Mean Daily Stream Flow

	New River (cfs)			Alamo River (cfs)		
Month	90%	Median	10%	90%	Median	10%
October	517	620	756	740	919	1,120
November	445	540	687	619	766	882
December	423	521	661	447	655	783
January	436	535	669	443	630	833
February	481	582	708	512	748	935
March	559	678	811	735	969	1,180
April	607	732	848	904	1,100	1,240
May	554	659	786	809	979	1,130
June	487	589	688	696	849	966
July	483	586	698	690	842	979
August	481	590	714	700	829	983
September	494	594	729	704	870	1,100
Source: USGS 2010						

Flooding

The Project area has been defined by the Federal Emergency Management Agency (FEMA) as a special flood hazard area. The New and Alamo rivers, along with the land between both rivers within 4.5 miles of the Salton Sea, are listed as Zone A.

The Zone A delineation refers to flood boundaries that are set using approximate methods (an estimation of the flood boundary) rather than a detailed hydraulic model. Therefore, the depth of flooding is not presented on the flood maps but is assumed to be less than 1 foot (typically how Zone A is represented). The area where the proposed SCH ponds would be located is shown on the flood map as within the Sea's inundation area. That is, it is not in the flood hazard area because it is part of the Sea.

3.11.2.6 Surface Water Quality

Sediment

Sediment loading to the Salton Sea comes from the New, Alamo, and Whitewater rivers, numerous natural watercourses that flow into the Sea, and also the individual drains and canals that directly enter the Sea. Total suspended solids, a measure of the sediment load, has been measured in both the New and Alamo rivers. These data indicate that the average total suspended solids for the New River is 217 milligrams per liter (mg/L) and 261 mg/L for the Alamo River. Assuming an average annual flow for the New River of 845 cfs and 612 cfs for Alamo River, then the annual sediment loading to the Sea is 132,000 and 232,600 tons/year for the New and Alamo rivers, respectively.

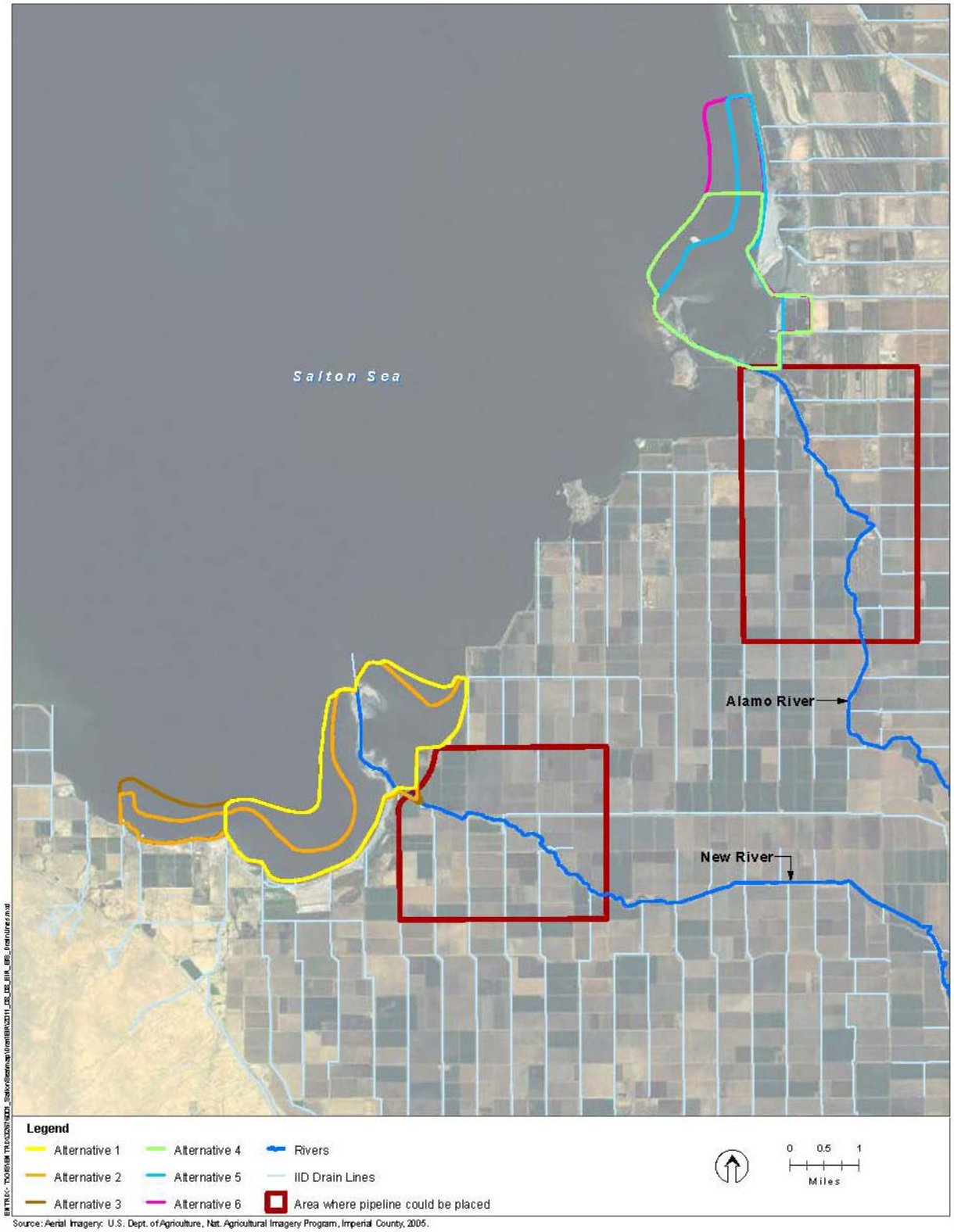


Figure 3.11-6 Imperial Irrigation District Service Area and Agricultural Drain Network

Constituents Included in the Water Quality Control Plan (Surface Water Quality Objectives)

The CRBRWQCB Water Quality Control Plan (2006) provides general surface water quality objectives for surface waters of the Colorado River Basin Region. These water quality objectives are compared below, by constituent of concern, to seasonal water quality data collected by the Bureau of Reclamation (Reclamation) in the Salton Sea and its tributaries in 2004–2010 (C. Holdren, Reclamation, unpublished data) (Table 3.11-5).

Table 3.11-5 Comparison of Water Quality Objectives with Current Conditions (2004-2010 Mean Annual)

		Current Conditions			
Constituent	Objective	Salton Sea	New River	Alamo River	Whitewater River
Suspended solids (mg/L)		39	217	261	56
Total dissolved solids (Salinity) (mg/L or ppt)	35 ppt (Sea) 4 ppt (Rivers)	51,829 mg/L 52 ppt in 2010	2,636 mg/L 2.6 ppt	1,987 mg/L 2.0 ppt	1,132 mg/L 1.1 ppt
Nitrate and nitrites (NO^3/NO^2) (µg/L)		209	4,142	5,862	12,846
Ammonia (NH^3) (µg/L)		1,157	1,750	1,347	1,019
Total phosphorus (µg/L)	35 (Sea)	103	976	624	1,419
Orthophosphate (µg/L)		42	536	306	992
Selenium (µg/L)	5	1.34	3.18	5.39	2.00
Dissolved oxygen range (mg/L)	5	—	3.2 – 11.5	5.0 – 12.5	3.8 – 10.4

Source: C. Holdren, Reclamation, unpublished data
Note: Objectives from CRBRWQCB Basin Plan 2006

Salinity

The CRBRWQCB's (2006) water quality objective for total dissolved solids (salinity) at the Salton Sea is to stabilize salinity at 35,000 mg/L or 35 parts per thousand [ppt]. Average salinity in the Sea in 2010 was 51,829 mg/L (approximately 52 ppt) (C. Holdren, Reclamation, unpublished data) (Table 3.11-5). Since 2004, average salinity in the Sea has increased by approximately 13.1 percent. Lower salinity conditions frequently occur near the tributaries and near the Sea's shoreline due to dilution by inflows. Higher salinity generally occurs in the Sea's center. The primary source of salts in the Sea's watershed is from imported Colorado River water. These salts are applied to fields with irrigation water and are carried off by tailwater or tilewater into surface drains. The Imperial Valley contributes a greater salt load to the Sea than does the Coachella Valley (DWR and DFG 2007).

The New, Alamo, and Whitewater rivers have average salinity concentrations of 2,636, 1,987, and 1,132 mg/L respectively (C. Holdren, Reclamation, unpublished data). Since 2004, average salinity in the New River has increased by approximately 23.6 percent, and average salinity in the Alamo River has increased by approximately 15.8 percent. Although salinities are increasing in both the New and Alamo rivers,

salinities are still below the CRBRWQCB's (2006) water quality objective of 4,000 mg/L for total dissolved solids (salinity). In general, the New River has slightly higher salinity than the Alamo River.

Selenium

Selenium is present in the water, sediment, and biota around the Salton Sea. Selenium bioaccumulation in biota is discussed further in Section 3.4, Biological Resources. Most of the selenium entering the Salton Sea originally comes from the upper Colorado River in water used to irrigate agriculture in the Imperial and Coachella valleys. Selenium becomes concentrated by agricultural usage and is discharged from subsurface tile drains into surface drains that flow into the Sea either directly or via tributaries (Saiki et al. 2010). Selenium concentrations in agricultural drains vary widely (0.790–79.1 micrograms/liter [µg/L]), averaging 4.18 µg/L in selected IID drains monitored in 2005–2009 (Saiki et al. 2010). Total selenium concentrations in the rivers averaged 2.0 µg/L in Whitewater, 3.2 µg/L in New, and 5.4 µg/L in Alamo in 2004–2010 (C. Holdren, Reclamation, unpublished data) (Table 3.11-5). Future scenarios modeled in the PEIR suggested that selenium in New and Alamo rivers would not exceed 10 µg/L by 2075 (DFG and DWR 2007).

Selenium enters the Salton Sea as highly soluble salt (primarily as selenate and selenite) and accumulates in the anoxic sediments on the Salton Sea floor (DWR and DFG 2007). Waterborne concentrations are rapidly reduced to less than 2 µg/L as selenium assimilates into biota and settles as part of the organically rich sediments. The anoxic nature of the Sea sediments is important in trapping the selenium in insoluble, non-bioavailable forms of selenite, elemental selenium, and selenide. The CRBRWQCB's (2006) water quality objective for selenium is 5 µg/L (4-day average).

Selenium concentrations in sediment were measured in 2010 at proposed Project sites adjacent to the mouths of the New and Alamo rivers. Mean selenium concentrations were 1.1 milligrams per kilogram (mg/kg) (range 0.54–2.3 mg/kg). The majority of sediment samples (63 percent) was less than 1 mg/kg of selenium and would be considered "low risk." The remaining 37 percent of the samples were between 1 and 4 mg/kg (only two samples exceeded 2.5 mg/kg) and were considered in the "level of concern" category. No sample exceeded the "toxicity threshold" value of 4 mg/kg (Amrhein and Smith 2011).

Oxidized selenium is present in the exposed playa sediments, and rewetting the sediments could result in a "flush" of selenium released into the pond water (DWR and DFG 2007; Amrhein et al. 2011). An experiment measured water-soluble selenium released from wetted sediment samples taken from the SCH Project area and incubated up to 235 days with low-salinity water (2 ppt and 13.7 ppt) (Amrhein et al. 2011; see also Appendix **I,** Selenium Management Strategies). Sediment selenium concentrations were positively related to organic carbon, but the oxidation rates and amount released into water did not appear affected by carbon content, salinity, location, or depth of sample core. Rather, the release of selenium appeared controlled by the amount of oxidizable iron present in sediments. If iron was present, the oxidized selenium adsorbed onto the iron and remained in the sediment, and less selenium would dissolve into pond water.

Temperature

The CRBRWQCB's (2006) water quality objective for temperature is that the receiving water's temperature should not be altered by waste discharges unless demonstrated that the temperature alteration does not adversely affect the receiving water's designated beneficial use. Water temperature was monitored at three sampling sites toward deep areas of the Sea in 1999 (Holdren and Montaño 2002, as cited in DWR and DFG 2007) and 2004–2010 (C. Holdren, Reclamation, unpublished data). The Sea's water surface temperatures ranged from a low of 12.8 degrees Celsius (˚C) (55.1 degrees Fahrenheit [˚F]) in February 2009 to a high of 36.5˚C 97.7˚F) (C. Holdren, Reclamation, unpublished data). The Salton

Sea is a polymictic lake (a lake having no stable thermal stratification), which can stratify and mix many times during the year.

In the rivers, water surface temperature was measured quarterly from 2004–2010. Temperatures were lowest in February 2009 (New River 11.7˚C [53.1˚F], Alamo River 11.5˚C [52.7˚F]) and highest in July 2006 (New River 31.1˚C [88.0˚F], Alamo River 31.9˚C [89.4˚F]) (C. Holdren, Reclamation, unpublished data). In general, the New River has slightly higher temperatures than the Alamo River.

Dissolved Oxygen

Dissolved oxygen is of particular concern at the Salton Sea because it is essential to support survival of fish and other aquatic organisms. Surface water (technically referred to as the epilimnion or epilimnetic water) is often supersaturated with respect to dissolved oxygen for several months during daylight hours, while water at the Sea's bottom near the Seabed (also referred to as the hypolimnion or hypolimnetic water) is virtually devoid of dissolved oxygen (Holdren and Montaño 2002, as cited in DWR and DFG 2007; Anderson and Amrhein 2003, as cited in DWR and DFG 2007). Dissolved oxygen supersaturation is often caused by photosynthetic production of oxygen during the daytime. Dissolved oxygen concentrations are a function of the geometry of the water body, wind fields, algal production, and biological and chemical oxygen demand in the water body. Frequently the geometry of a large water body is described in relation to depth and fetch. The fetch is a measure of the water surface area where the wind continues at a constant direction and speed (DWR and DFG 2007).

Thermal stratification leads to accumulation of chemically reduced compounds in the hypolimnion. The anaerobic microbial and decomposition of organic matter in an anoxic hypolimnion produce hydrogen sulfide and ammonia, constituents that are toxic to most aquatic life. When wind action mixes hypolimnetic and surface waters and breaks down stratification, these toxic components are distributed throughout the water column and deplete dissolved oxygen. These mixing events have been linked with massive fish kills (Schladow 2004, as cited in DWR and DFG 2007), although fish kills are observed during all seasons, including some that result from low water temperatures.

A dissolved oxygen concentration of about 4 to 5 mg/L is generally considered necessary for most aquatic species. Tilapia can tolerate infrequent very low dissolved oxygen concentrations, generally less than 2 mg/L (FAO 1986, as cited in DWR and DFG 2007) and briefly 1 mg/L (personal communication, K. Fitzsimmons 2010). The CRBRWQCB's (2006) water quality objective for dissolved oxygen of all designated "warm freshwater habitat (WARM)" surface waters (see Table 3.11-3) within the Colorado River Basin states that dissolved oxygen should not be reduced below the minimum level of 5 mg/L. In addition, the CRBRWQCB's (2010b) TMDL for dissolved oxygen in the New River is 5 mg/L.

Vertical profiles of dissolved oxygen were measured in the Salton Sea 1999 (Holdren and Montaño 2002, as cited in DWR and DFG 2007) and 2004–2010 (C. Holdren, Reclamation, unpublished data). Dissolved oxygen ranged from 20.6 mg/L and greater than 370 percent saturation in the surface water to zero in the bottom water. A period of severe dissolved oxygen depletion during August and September 1999 (0.21 mg/L as surface dissolved oxygen on September 8, 1999) coincided with extensive fish kills (Holdren and Montaño 2002, as cited in DWR and DFG 2007).

In the New River, dissolved oxygen ranged from 11.5 mg/L in November 2008 to a low of 3.2 mg/L in July 2006 (C. Holdren, Reclamation, unpublished data). In the Alamo River, dissolved oxygen ranged from 12.5 mg/L in November 2008 to a low of 5.0 mg/L in May 2007 (C. Holdren, Reclamation, unpublished data). In general, the Alamo River has slightly higher dissolved oxygen concentrations than the New River.

Nutrient

The Salton Sea is a eutrophic to hypereutrophic water body characterized by high nutrient concentrations, high algal biomass as demonstrated by high chlorophyll a concentrations, high fish productivity, low clarity, frequent very low dissolved oxygen concentrations, massive fish kills, and noxious odors (Setmire 2000, as cited in DWR and DFG 2007). The eutrophic conditions appear to be controlled (i.e., limited) by phosphorus. In addition, nutrients can stimulate the overproduction of algae, which can lead to low dissolved oxygen and the production of hydrogen sulfide (DWR and DFG 2007).

Phosphorus

Phosphorus is an essential nutrient for plant and algal growth. Setmire et al. (2001, as cited in DWR and DFG 2007) identified phosphorus as the limiting nutrient at the Salton Sea, and others (Holdren and Montaño 2002, as cited in DWR and DFG 2007; Schladow 2004, as cited in DWR and DFG 2007) have supported this conclusion. Phosphorus is present in water bodies in many forms, including soluble and particulate organic phosphates from algae and other organisms, inorganic particulate phosphorus, polyphosphates, and soluble orthophosphates. Soluble orthophosphate is assimilated by phytoplankton and therefore is an important indicator of productivity and quality. Total phosphorus is another indicator of the maximum level of productivity of a water body (DWR and DFG 2007). Eutrophic lakes are typically associated with total phosphorus concentrations of 16-386 µg/L, which is very productive for warm water fisheries.

In the Salton Sea, levels of soluble orthophosphates during 2004-2010 were lowest during the spring and summer months and highest during the winter months, correlating with typical seasonal algal growth patterns. Total phosphorus concentrations were lowest in the spring and summer months and highest in the fall and winter months, with peak concentrations as high as 756 µg/L (C. Holdren, Reclamation, unpublished data). The Sea's concentration of phosphorus was nearly the same in 1968/69 as in 1999 despite a 100 percent increase in external phosphorus loading (Setmire et al. 2001, as cited in DWR and DFG 2007), which indicates an effective phosphorus removal mechanism in the Salton Sea. Annual average total phosphorus concentration for 2004-2010 was 103 µg/L (C. Holdren, Reclamation, unpublished data), which exceeds the draft TMDL target of 35 µg/L (CRBRWQCB 2006).

In the rivers during 2004-2010, average levels of soluble orthophosphates were 75 percent greater in the New River compared to the Alamo River (536 µg/L and 306 µg/L, respectively) (Table 3.11-5) (C. Holdren, Reclamation, unpublished data). Similar to the Salton Sea, during the summer months levels of soluble orthophosphates and total phosphorus were lowest. Total phosphorus concentrations are highest during the fall months at the New River and during the winter months at the Alamo River. Average annual concentrations of total phosphorus were approximately 56 percent greater in the New River compared to the Alamo River (976 µg/L and 624 µg/L, respectively) (C. Holdren, Reclamation, unpublished data). Nutrient concentrations have not decreased recently, despite TMDLs for total suspended solids and phosphorus or changes in agricultural practices (personal communication, C. Holdren Reclamation, 2010).

Nitrogen

Nitrogen is present in water bodies in several forms. Ammonia is the form most readily utilized by phytoplankton, and is typically found in water with low oxygen concentrations. Bacteria can break ammonia down to form nitrite, which, in turn, is converted to nitrate. Nitrate is commonly found in surface water. Nitrogen in the inflows to the Salton Sea is primarily in nitrate-nitrite form. Nitrate-nitrite levels in the rivers were approximately 20-30 times greater than in the Sea (Table 3.11-5) (C. Holdren, Reclamation, unpublished data).

Most of the nitrogen in the Salton Sea consists of ammonia and organic nitrogen. High levels of ammonia indicate frequent reducing conditions in the Sea, and contribute to anoxia and fish kills. The annual mean concentration of ammonia for 2004–2010 was 1,157 µg/L in the Sea, 1,750 µg/L in New River, and 1,347 µg/L in Alamo River (Table 3.11-5) (C. Holdren, Reclamation, unpublished data). Concentrations in the New River are approximately 30 percent greater than in the Alamo River (C. Holdren, Reclamation, unpublished data).

Pesticides and Contaminants

A large percentage of the water the Salton Sea receives is from agricultural runoff, which contains numerous pesticides and heavy metals at levels that can be toxic to aquatic organisms (de Vlaming et al. 2004 and Phillips et al. 2007, as cited in Wang et al. 2011). Concentrations of pesticides in sediments and water correlate with their seasonal usage in the adjacent agricultural areas (LeBlanc and Kuivila 2008, as cited in Wang et al. 2011). Concentrations were highest near the shoreline and mouth of inflowing rivers, but levels dropped below detection off shore.

In 2010, levels of chlorinated insecticides and pyrethroids were measured in water of the New and Alamo rivers and in the bed sediments at potential SCH pond sites (Wang et al. 2011**;** see also Appendix J, Summary of Special Studies). In the water (four samples per river), most organochlorine pesticides were < 1.5 nanograms per liter (ng/L) or were not detected. Chlorpyrifos was the most frequently detected, but only one sample at the New River (80 ng/L) exceeded the DFG Hazardous Assessment Criteria (14 ng/L 4-day average) (Siepmann and Finlayson 2000, as cited in CRBRWQCB 2008). Of pyrethroids, permethrin (3.3-7.5 ng/L) was the most commonly detected, and fenpropathrin (New River, 11.6 ng/L) was detected once at elevated levels.

Sediment concentrations of pesticides were also measured in 2010 at exposed playa and submerged sites (Wang et al. 2011). Samples were taken at three depths (0-5 centimeters [cm], 5-15 cm, and 15-30 cm deep) in order to discriminate potential differences in deposition of legacy (i.e., organochlorines) and current-use pesticides. Total sediment pesticide concentrations detected ranged from 0.2 to 120 nanograms per gram [ng/g]. Sediment pesticide concentrations, particularly organochlorines, were greatest at the mouth of both the New and Alamo rivers. Dichlorodiphenyltrichloroethane (DDT) and its metabolites were detected in all samples, and dichlorodiphenyldichloroethylene (DDE) was the predominant pesticide residue. In general, the concentrations of organochlorine pesticides were higher in the 5–30 cm depth interval than in the 0–5 cm depth interval (more recent deposition). This correlation equates with the banning of most organochlorine pesticides, including DDT, in the United States in the 1970s. Mean DDE concentrations in at New River were 1.14 to 6.52 ng/g at the surface (0 to 5 cm deep) and 0.89 to 9.10 ng/g subsurface (5 to 15 cm and 15 to 30 cm deep). Mean DDE concentrations in sediments at Alamo River were 13.41 to 13.66 ng/g at the surface (0 to 5 cm deep) and 9.16 to 25.02 ng/g subsurface (5 to 15 cm and 15 to 30 cm deep) (Table 3.11-6). Organochlorine pesticide concentrations showed a pattern of decreasing concentration with distance from the river mouths. The highest DDE concentrations were documented in East New and immediately adjacent to the Alamo River mouth in Morton Bay (Wang et al. 2011). Lower concentrations of DDE were documented at the Mid New River and Alamo River-Davis Road sites (Wang et al. 2011). The lowest DDE concentrations were documented at the Far West New River sites (Wang et al. 2011).

Table 3.11-6 DDE Concentrations in Sediment at SCH Project Area (ng/g)

Location	Surface Mean (# samples)	Surface Maximum	Subsurface Mean (# samples)	Subsurface Maximum
New River - East	6.52 (11)	23.71	9.10 (21)	41.16
New River - Middle	2.78 (15)	7.99	5.44 (29)	33.51
New River - Far West	1.14 (6)	2.90	0.89 (13)	2.41
Alamo River - Morton Bay	13.66 (11)	32.41	25.02 (19)	102.60
Alamo River - North (Davis Road)	13.41 (7)	34.40	9.16 (14)	38.26

Source: Calculated from raw data in Wang et al. 2011. Surface (0-5 cm deep) and Subsurface (5-15 cm and 15-30 cm deep). Nondetect values were defined as 0.01 ng/g for purpose of calculating means. Samples were pooled for air-exposed and submerged sites within each location.

The frequency of surface sediment samples exceeding a sediment guideline of 31.3 ng/g total DDE (Probable Effects Concentration [PEC], MacDonald et al. 2000, as cited in CRBRWQCB 2008) was 18 percent at Alamo River-Morton Bay (32.41 ng/g maximum); 14 percent at Alamo River-Davis Road (34.40 ng/g maximum); and none at New River sites. The frequency of subsurface samples exceeding the PEC was 37 percent at Alamo River-Morton Bay (102.60 ng/g maximum); 7 percent at Alamo River-Davis Road (38.26 ng/g maximum); and 10 percent at New River East (41.16 ng/g maximum); 3 percent at New River Middle (33.51 ng/g maximum); and none at New River West. Further analysis of potential biological impacts to biota utilizing the SCH ponds is provided in Section 3.4.4. Mean DDE sediment concentrations (0-5 cm deep) were measured at nearby sites by USGS in 2006-2008 (Miles et al. 2009). For comparison, 0-5 cm depth were 4-48 ng/g at the Reclamation/USGS Saline Habitat Ponds, 41-56 ng/g in Alamo River, 15-41 ng/g in the Salton Sea near Alamo River, 60-98 ng/g at the Freshwater Marsh near Morton Bay, and 2-6 ng/g at the D-Pond on the Sonny Bono Salton Sea National Wildlife Refuge (NWR) (Miles et al. 2009). With the exception of the D-Pond, these concentrations are similar or higher than the levels measured at the Salton Sea SCH alternative sites.

Chlordane (organochlorine, < 1.2 ng/g New River, < 3 ng/g Alamo River) and bifenthrin (pyrethroid, < 0.5 ng/g New River, < 1.9 ng/g Alamo River) were also detected, but at lower levels than DDE. Other pesticides were infrequently detected (Wang et al. 2011).

3.11.2.7 Groundwater Hydrology and Quality

Groundwater is present throughout the Salton Sea Basin and is extracted for consumptive use. The sources of groundwater include:

- Percolation of ancient seawater associated with the Gulf of California when the Gulf extended north into the Salton Trough;
- Direct infiltration from the Colorado, New, and Alamo rivers, both currently and previously when these rivers discharged to the Salton Trough;
- Deep percolation of applied agricultural irrigation water;
- Leakage from the numerous unlined irrigation canals;

- Percolation of precipitation over the basin proper, including the mountains that comprise part of the watershed; and
- Direct groundwater recharge and recovery projects such as projects currently operating in the Coachella Valley (LLNL 2008).

The Project area is part of the Imperial Valley Groundwater Basin. Previous studies (LLNL 2008) have found that production of groundwater in the central portion of the Imperial Valley is limited because of the low permeability of the aquifer and also poor groundwater quality. The low permeability is a consequence of the deposition of former lakebed sediments that comprise the Imperial Valley soils. Some of these sediments have low transmissivity and, therefore, do not produce significant amounts of groundwater. The groundwater is characterized as occurring in a shallow system (ground surface to 2,000 feet deep) and a deeper system (extending to bedrock). The shallow system in the Imperial Valley Groundwater Basin consists of low permeability lake deposits from 0-80 feet, a low-permeability aquitard from 60-450 feet, and alluvium down to about 1,500 feet (LLNL 2008). Well production data are limited for the Imperial Valley aquifer, but available data suggest the wells in the central portion of the aquifer (closest to the Project area) have the following characteristics:

- Production rates of less than 100 gallons per minute (0.2 cfs);
- Salinity generally ranged between 1,000 and 2,000 mg/L to as high as 15,700 mg/L; and
- Hydraulic conductivity of 0.6 foot/day (LLNL 2008).

Although groundwater in the central Imperial Valley aquifer is saline, this source is not a replacement for the Salton Sea as a source of saline water for the Project (the salinity is less than the lowest pond salinity proposed). At this time, it appears that groundwater is not a suitable replacement supply for the river water used in the Project because of inadequate yield of the shallow groundwater. This source may have a use in augmenting the river supply, especially if saline groundwater is used. However, insufficient data exist regarding this supply including depth to groundwater, yield, salinity, subsidence, and location of cost-effective production wells, to carry this supply forward in the Project. This supply can be reevaluated at a later time if additional data are available.

3.11.3 Impacts and Mitigation Measures

3.11.3.1 Impact Analysis Methodology

The impact assessment of the Project's hydrologic and water quality effects was performed by superimposing the proposed Project actions on the hydrologic record of the New and Alamo rivers, with consideration of the aspects of the Project design that are intended to avoid impacts. The presence of the IID drains and local groundwater conditions were also considered in the analysis. Water quality modeling was also used to examine the hydrologic operations with a range of residence times and salinities (as produced by blending river and saline water), and to evaluate potential water quality outcomes in the ponds (seasonal and vertical profiles of dissolved oxygen and temperature) (B. Barry and M. Anderson, University of California Riverside, unpublished data).

Several Project features are common to all alternatives. The common features with specific hydrologic/hydraulic importance are outlined below:

- **Berms for Natural Watercourses**. The berms for all alternatives would be constructed to avoid the large natural watercourses that enter the Project site west of the New River and east of the Alamo River. Large flows in these watercourses would continue to flow to the Salton Sea without interruption by SCH facilities.

- **Interception Ditch**. The interception ditch would be sized to accommodate the anticipated flows in the IID drains that the interception ditch intersects (Figure 3.11-6). The interception ditch capacity would be based on monitored drainflow on data collected by IID for the drains. The invert of the interception ditch would be set to avoid creating a backwater condition in the drains and allow continuity between the drains for pupfish.
- **Water Diversion.** The total diversion to the SCH ponds from the river and the Sea would vary by alternative and by the final operations (Table 3.11-7). Factors such as time of year, pond size and depth, residence time in the ponds, and salinity would influence the diversion from the river and the Sea. For the maximum SCH pond size (Alternative 3), assuming a salinity of 20 ppt and a 2-week residence time, the average total diversion would be up to 474 cfs, with 313 cfs from the New River and 162 cfs from the Sea. In the peak evaporation period (June), the total diversion would be 494 cfs, with 333 cfs from the New River and 161 cfs from the Sea. The diverted water would cycle through the SCH ponds with a 2- to 32-week residence time before it was returned to the Sea. During the holding time, the only loss of water would be to evaporation.
- **Gravity River Diversion**. The river gravity diversion would be located upstream (between 2 and 4 miles) of the Project area at a location that provides sufficient head to facilitate flow by gravity and enables necessary easements to be negotiated with landowners. This is a feature common to Alternatives 1 and 4.
- **Pumped River Diversion**. The pumped diversion would be located adjacent to the SCH ponds. This is a feature common to Alternatives 2, 3, 5, and 6.
- **River Diversion Structures**. The structures needed to divert water by gravity or pumping would be constructed by notching the banks of the river to set the structures into the bank rather than allowing them to project into the river. This notching would help avoid debris fouling and maintain the river cross section that is used by floodwater. Because the river is incised relative to surrounding ground (up to 15 feet in some areas), this action would not involve altering a levee, but rather excavating into native ground to create the notch. Putting the facilities into a notch in the bank would require the use of sheet pile during construction to separate the river from the work area. Its use has the benefit of being able to dry out the work area and avoid discharge of sediment from the construction area into the river. The completed diversion area will be lined with riprap or other suitable material to stabilize the bank and prevent erosion near the diversion.
- **SCH Outflow Structure**. Each SCH pond would have an independent outlet to the Salton Sea. Water would be released to the Sea through the pond outlet based on the residence time and the time to drain a pond, if needed.
- **Emergency Outflow Structure**. Each pond also would have an emergency outflow structure (usually combined with the outflow structure that would allow the release of water during an emergency). The structure would be a weir that water would flow over and through the outlet in an emergency. The structure would not require human intervention to operate. The outlet pipe and weir would be sized based on a 100-year, 24-hour rainfall falling on the SCH ponds (2.74 inches of rain) and also an extreme event, such as the rainfall associated with the hurricane that dropped 4.84 inches of rain in 2 days in 1977.

Table 3.11-7 Estimated Annual Diversion Rates for SCH Under Differing Residence Times and Salinities[1]

	Residence time (days)	Total annual diversion (af)	Average annual diversion (cfs)	Average diversion rate (cfs) to achieve target salinity					
				20 ppt		30 ppt		40 ppt	
				Saline (cfs)	River (cfs)	Saline (cfs)	River (cfs)	Saline (cfs)	River (cfs)
Alternative 1	14	286,271	396	135	261	210	185	286	110
	28	152,459	211	67	144	105	106	142	68
	56	85,553	118	33	85	52	66	71	48
	112	52,100	72	16	56	25	47	35	37
Alternative 2	14	189,264	261	87	174	136	125	185	77
	28	102,563	142	43	99	68	74	92	50
	56	59,213	82	21	61	33	48	46	36
	112	37,538	52	10	42	16	36	22	30
Alternative 3	14	343,290	474	162	313	252	222	342	132
	28	182,873	253	80	172	125	127	171	82
	56	102,664	142	39	102	62	80	85	57
	112	62,560	86	19	67	30	56	42	45
Alternative 4	14	174,889	242	81	161	127	115	172	70
	28	94,263	130	40	90	63	67	86	45
	56	53,950	75	20	55	31	43	42	32
	112	33,794	47	9	37	15	32	21	26
Alternative 5	14	142,180	196	65	131	102	95	138	58
	28	77,275	107	32	75	51	56	69	38
	56	44,822	62	16	46	25	37	34	28
	112	28,596	39	8	32	12	27	17	23

Table 3.11-7 Estimated Annual Diversion Rates for SCH Under Differing Residence Times and Salinities[1]

	Residence time (days)	Total annual diversion (af)	Average annual diversion (cfs)	Average diversion rate (cfs) to achieve target salinity					
				20 ppt		30 ppt		40 ppt	
				Saline (cfs)	River (cfs)	Saline (cfs)	River (cfs)	Saline (cfs)	River (cfs)
Alternative 6	14	239,706	331	112	219	174	157	237	94
	28	128,602	178	55	122	87	91	118	60
	56	73,051	101	27	74	43	58	59	42
	112	45,275	63	13	49	21	42	29	34

Notes:

1. Assumes Sea salinity of 51 ppt and river salinity of 2 ppt.

Using data from the California Irrigation Management Information System database, the average annual evaporative losses for the Project conditions are estimated at an annual average of 31 cfs (3,770 acres at 71.4 inches of evaporation per year). Of the 474 cfs diverted from the river and the Sea, (for maximum pond size and 2-week residence time) approximately 443 cfs would be returned to the Sea. The evaporation loss of 31 cfs represents 5.1 and 3.7 percent of the annual average flow of the New and Alamo rivers, respectively. For the peak month, the evaporation for 3,770 acres would be 51 cfs, or about 8.3 percent and 6.0 percent of the flow in the New and Alamo rivers (Table 3.11-8 and Table 3.11-9).

The manner in which the SCH ponds could be operated would affect the total water diverted (Appendix D). The SCH ponds could be operated for constant or variable salinity, storage, and residence time. The results presented in Table 3.11-7 through Table 3.11-9 assumes that the entire SCH would be operated as one pond rather than individual pond units. However, changing the operations to allow variable salinity (e.g., high in summer and lower in winter), operating each pond to different requirements, or varying storage, would change the maximum and minimum diversion rates. The total diversion from the rivers and therefore, the total Project impact, would be controlled by Project operation. Because the SCH Project is a "proof-of-concept" design, a potential range of operations may be tried.

Based on simulations of possible Project operations, the diversion of river water to the SCH ponds would reduce the average annual flow and the peak monthly flow immediately downstream of the diversion (Table 3.11-8 and Table 3.11-9). The reduction would be present only in the portion of the river between the diversion and the Sea. The water would be returned to the Sea, less the evaporation loss that occurred while the water was in the SCH ponds. For the average annual condition, the diversion would range from 5 percent to 51 percent of the New River flow and 3 percent to 26 percent for the Alamo River, depending on the pond size, pond salinity, and residence time. For the peak evaporation month (June), the reduction downstream of the diversion would range from 7 percent to 56 percent for the New River and 4 percent to 28 percent of the Alamo River flow. The reductions in flow would be offset by the flow returned to the Sea from the ponds (Figures 3.11-7 and 3.11-8) (these figures are based on Alternative 3, which would restore the greatest amount of habitat).

The total salt loading to the Salton Sea from the rivers would only be decreased by the amount of salt that deposited (drops out of solution) in the SCH ponds. During steady-state operations (a constant salinity and storage in the SCH ponds), the salt load diverted into SCH ponds from the combined river and Sea diversions would equal the load released from the SCH ponds back to the Sea. Therefore, the SCH ponds would not act as a salt sink that reduces the salt load to the Sea. The exception would be salt that may precipitate out of solution. This amount of salt is considered too small to be a factor in the total salt balance.

3.11.3.2 Thresholds of Significance

Significance Criteria

Impacts on hydrology and water quality would be significant if the Project alternatives would:

- Reduce the flow in a river to the detriment of downstream water users;
- Raise the elevation of water in the IID drains, resulting in the backup of water into on-farm drains;
- Change the Salton Sea's water surface elevation and salinity to an extent that the change would in itself adversely affect or preclude the uses of the Salton Sea identified in the Basin Plan;

Table 3.11-8 River Diversions as a Function of Average Annual New and Alamo River Flows

	Residence time (days)	Average annual diversion (cfs)	Percent of River Flow Diverted to Achieve Target Salinity					
			20 ppt		30 ppt		40 ppt	
			New River (%)	Alamo River (%)	New River (%)	Alamo River (%)	New River (%)	Alamo River (%)
Alternative 1	14	396	43		30		18	
	28	211	24		17		11	
	56	118	14		11		8	
	112	72	9		8		6	
Alternative 2	14	261	28		20		13	
	28	142	16		12		8	
	56	82	10		8		6	
	112	52	7		6		5	
Alternative 3	14	475	51		36		22	
	28	252	28		21		13	
	56	141	17		13		9	
	112	86	11		9		7	
Alternative 4	14	242		19		14		8
	28	130		11		8		5
	56	75		7		5		4
	112	46		4		4		3

Table 3.11-8 River Diversions as a Function of Average Annual New and Alamo River Flows

	Residence time (days)	Average annual diversion (cfs)	Percent of River Flow Diverted to Achieve Target Salinity					
			20 ppt		30 ppt		40 ppt	
			New River (%)	Alamo River (%)	New River (%)	Alamo River (%)	New River (%)	Alamo River (%)
Alternative 5	14	196		15		11		7
	28	107		9		7		4
	56	62		5		4		3
	112	40		4		3		3
Alternative 6	14	331		26		19		11
	28	177		14		11		7
	56	101		9		7		5
	112	62		6		5		4

Table 3.11-9 River Diversions as a Function of Peak New and Alamo River Flows[1]

	Residence time (days)	Peak monthly diversion (cfs)	Percent of Peak River Flow Diverted to Achieve Target Salinity					
			20 ppt		30 ppt		40 ppt	
			New River (%)	Alamo River (%)	New River (%)	Alamo River (%)	New River (%)	Alamo River (%)
Alternative 1	14	412	47		34		21	
	28	227	27		21		14	
	56	134	17		14		11	
	112	86	12		10		9	
Alternative 2	14	275	32		24		15	
	28	155	19		15		11	
	56	95	13		11		9	
	112	63	9		8		7	
Alternative 3	14	494	56		41		26	
	28	272	33		25		17	
	56	161	21		17		13	
	112	103	14		12		10	
Alternative 4	14	253		21		15		10
	28	142		12		9		7
	56	86		8		7		5
	112	57		6		5		4
Alternative 5	14	207		17		13		8
	28	118		10		8		6
	56	72		7		6		5
	112	49		5		4		4

Table 3.11-9 River Diversions as a Function of Peak New and Alamo River Flows[1]

	Residence time (days)	Peak monthly diversion (cfs)	Percent of Peak River Flow Diverted to Achieve Target Salinity					
			20 ppt		30 ppt		40 ppt	
			New River (%)	Alamo River (%)	New River (%)	Alamo River (%)	New River (%)	Alamo River (%)
Alternative 6	14	346		28		20		13
	28	193		16		13		9
	56	116		11		9		7
	112	75		7		7		6

Notes:
1. River flow for the peak diversion month (June).

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface water runoff, in a manner that would result in substantial erosion, siltation, or flooding;
- Substantially deplete groundwater supplies or interfere with groundwater recharge that would cause a deficit in the aquifer volume or lower the local groundwater level;
- Place structures within a 100-year flood hazard area (as mapped on a Federal Flood Hazard Boundary, Flood Insurance Rate Map, or other flood hazard delineation map) that would impede or redirect flood flows or expose people or structures to significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Cause inundation by seiche, tsunami, or mudflow;
- Violate any water quality standards or waste discharge requirements; or
- Substantially degrade water quality.

Application of Significance Criteria

A summary of the overall methodology used in applying the significance criteria to the Project alternatives follows:

- **Reduce the flow in a river to the detriment of downstream water users –** The Project would reduce the average annual flow in the New or Alamo rivers by up to 261 cfs immediately downstream of the diversion (assuming a 2-week residence time and 20 ppt salinity). Of this total diversion, up to 170 cfs would be returned to the Salton Sea, but at a different location than the diversion point. The reduction in flow in the river would occur from the diversion point to the outlet of the river into the Sea (about 1 mile for the pumped diversion and 3-4 miles for a gravity diversion). No downstream water rights holders would be affected by the diversion. As stated above, Metropolitan Water District of Southern California has applied for water rights on both the New and Alamo rivers, but has not advanced the claim any further than the initial application. The Salton Sea is the ultimate recipient of the water in the rivers, and the Project would only consumptively use the water lost to evaporation from the SCH ponds. The reduction in river flow due to the SCH Project would not adversely affect downstream water users, and this issue is not addressed further in this section. Impacts on biological resources from the reduction in flow are addressed in Section 3.4, Biological Resources.
- **Raise the elevation of water in the IID drains, resulting in the backup of water into on-farm drains –** The river diversion (both pumped and gravity) would be set into the river bank and would not increase the water surface elevation in the rivers; therefore, the diversion would not affect the drains that empty into the rivers. The interception ditch along the edge of the SCH ponds would be designed to avoid backing water up into the drains and so would not impair the flow of agricultural systems that empty into the drain. In addition, the SCH pond berms would terminate before intersecting an IID drain that is not handled with the interception ditch, including IID drains that receive large amounts of natural storm runoff. The presence of the water stored in the SCH ponds at an elevation of -228 feet msl would not influence the shallow groundwater conditions in the vicinity of the ponds, including to the south near agricultural lands, because the interception ditch would intercept and collect seepage from the SCH ponds that would otherwise move south toward agricultural land. The sedimentation basin would be located upstream of the SCH ponds, adjacent to the diversion structure, and would store about 6 feet of water. This water would not seep into adjacent fields or drains, however, because the bottom of the sedimentation basin would be from 15–20 feet

below the ground surface, well below the depth of the on-farm drains or IID drains (typically 4–6 feet below the ground surface). Because of these design elements, this criterion is not a Project impact and is not considered further.

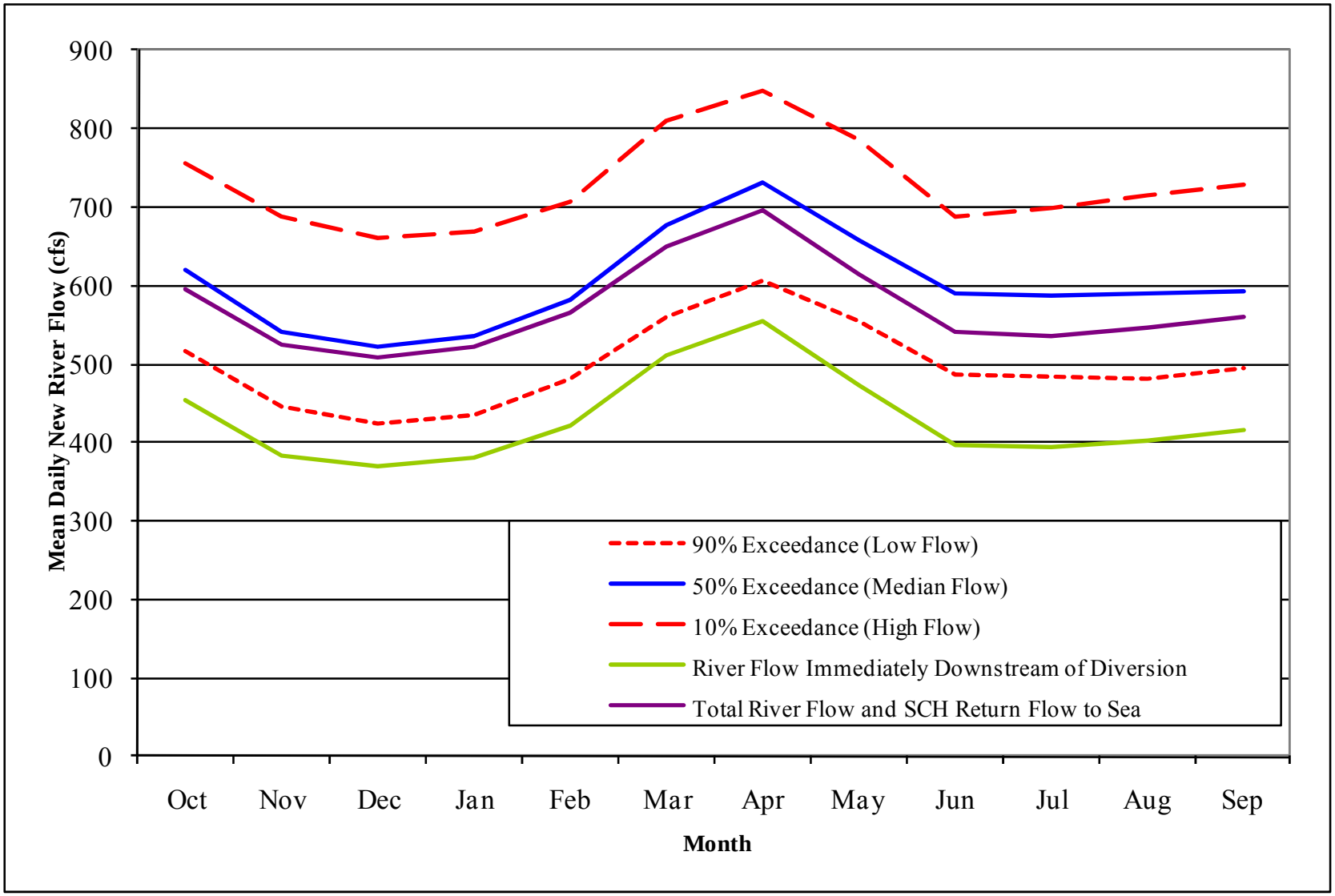
- **Substantially change the Salton Sea's water surface elevation and salinity** – The Project has the potential to affect the water surface elevation and salinity of the Sea due to the temporary detention of water in the SCH ponds. This impact is discussed below. Because the diverted water would pass through the SCH ponds, losing water only to evaporation, both water and salt would be returned to the Sea.

Substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion, siltation, or flooding – The SCH ponds would be located on areas that are recently exposed (dry) playa or are currently submerged. Rainfall on the dry playa would drain to the Sea or ponds before being evaporated. Rainfall on the SCH ponds temporarily would be retained in the ponds and would not cause an increase in erosion. Therefore, changing drainage patterns on the playa is not considered further. The drainage pattern of the IID drains would be altered by the SCH Project because some of them would be intersected by the interception ditch. The interception ditch would be designed to convey the historic flow in the drains and maintain a channel elevation that is lower than the elevation of the drains to avoid backing water into the drains. The IID drains would remain in a free-flowing condition and maintain the connectivity between the drains that is currently afforded by the Sea. The interception ditch would also collect shallow groundwater that seeps from the SCH ponds. Therefore, the Project would alter the drainage pattern of the IID drains, but not substantially or in a manner that could result in substantial erosion, siltation, or flooding; therefore, this impact is not addressed further.

Water from the New and Alamo rivers would supply the SCH ponds, but the course of the rivers would not be changed. The structures that would be used to divert water would be set into the river banks and stabilized with riprap, thus preventing erosion. Less water would be carried in the rivers after the water was diverted, thus lessening the potential for siltation, erosion, and flooding. This impact therefore, is not addressed further.

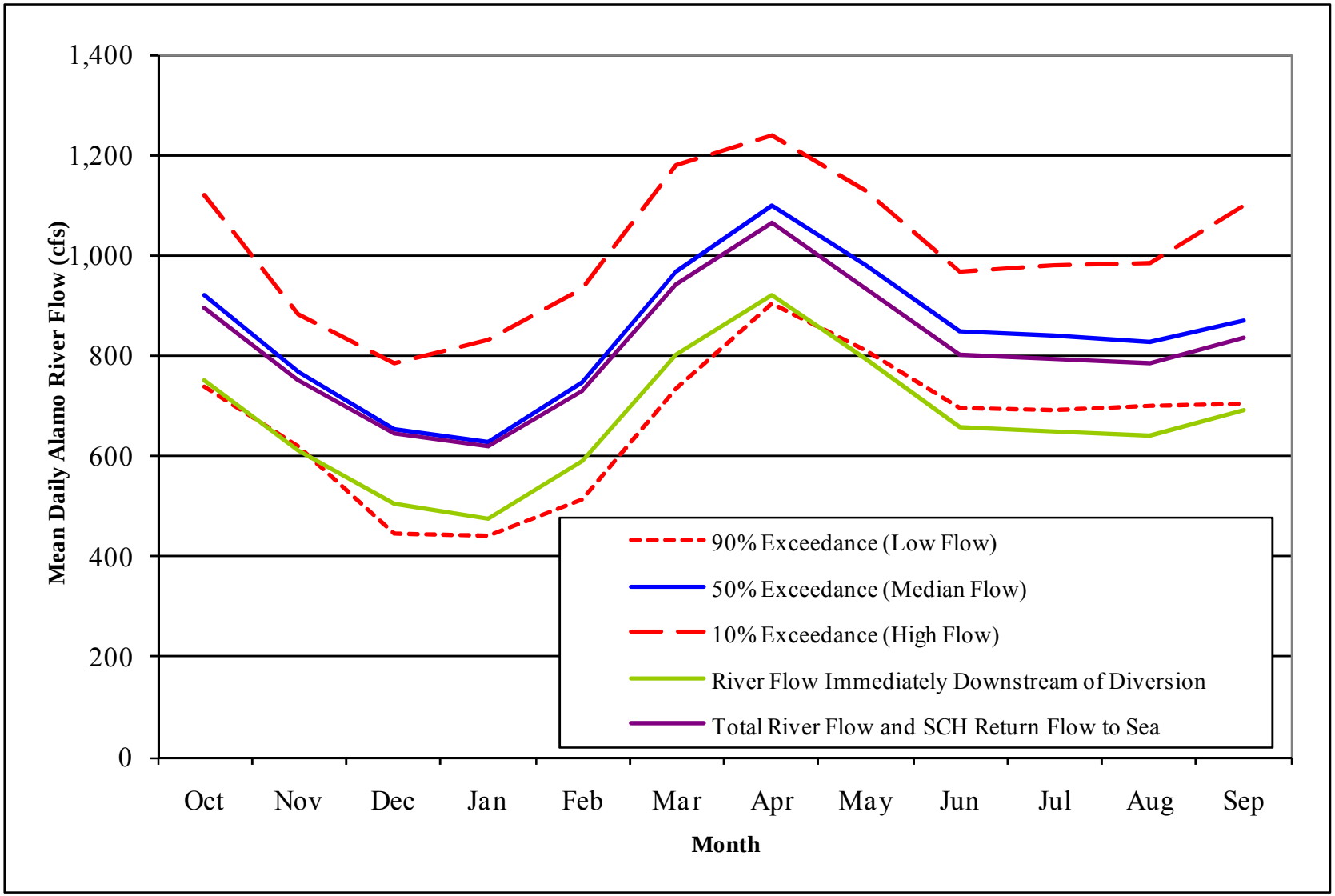
- **Substantially deplete groundwater supplies or interfere with groundwater recharge –** The local groundwater conditions reflect a shallow perched water table that receives inflows from the IID drains and applied water that is not captured in on-farm drains. The Project would store water on otherwise dry playa and, therefore, would provide seepage (additional water) to the shallow groundwater system. The interception ditch would intercept a portion of this seepage, and the remainder would flow toward the Salton Sea. This Project would not interfere or cause a deficit with groundwater resources and, therefore, is not an impact on groundwater. If future studies suggest that shallow groundwater is a potential water supply for the Project, additional environmental review will be needed before the supply can be used.

- **Place structures within a 100-year flood hazard area that would impede or redirect flood flows or expose people or structures to significant risk from floodi**ng – The proposed SCH sites would be located adjacent to Flood Zone A defined by FEMA. The diversion (both gravity and pumped) is designed to be recessed into the bank of the river so as to maintain the channel cross section and avoid collecting debris on the diversion works. In addition, the diversion would remove water from the river, thereby decreasing the flow and lowering the water surface elevation in the river at the diversion and downstream, which would reduce the risk of flooding.



Assumes 20 ppt salinity and 4-week residence time for Alternative 3

Figure 3.11-7 New River Flow Rates with Project Diversion



Assumes 20 ppt salinity and 4-week residence time for Alternative 3

Figure 3.11-8 Alamo River Flow Rates with Project Diversion

Other structures constructed under this Project include berms, which are not habitable structures as defined by FEMA. Moreover, if the berms failed, the impounded water would be released directly to the Salton Sea or onto exposed playa where it would then flow to the Sea, and their failure would not expose people to risk of injury or death. The bottom of the sedimentation basin would be from 15 to 20 feet below the ground surface and, therefore, would not pose a flood hazard.

This Project would include a trailer or similar facility that would serve as office space for the permanent employees. It would be constructed on adjacent ground above the -228-foot elevation. This facility would be in the Zone A delineated by FEMA. Any facility would be constructed in conformance with the Imperial County floodplain regulations for elevation, flood proofing, and tie-downs (for a trailer). These design features would reduce the flood potential and, therefore, by design avoid a flooding-related impact. Thus, impacts from placing structures with the floodplain are not discussed further.

- **Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff** – The drainage structures in the SCH ponds including the diversion and emergency release from the ponds is sized to accommodate the anticipated conditions at the Project site. No runoff would be generated in excess of the capacity of the drainage facilities, and this impact is not discussed further.
- **Cause inundation by seiche, tsunami, or mudflow –** The Project would not contribute to a seiche, tsunami, or mudflow. It is not located near the ocean and, therefore, would not be affected by tsunamis. It also is located in a generally level area, so mudflows are not a concern. Seiches could occur in the Salton Sea, most likely as a result of earthquakes, but they would not be caused by the Project, and this impact is not discussed further.
- **Violate any water quality standards or waste discharge requirements** – The operation of the SCH ponds to restore habitat and grow fish would not preclude the use of New and Alamo river water, nor Salton Sea water, for their designated beneficial uses as outlined in Table 3.11-3 and the CRBRWQCB Water Quality Control Plan. Therefore, this impact is not discussed further. The potential for the Project to conflict with CRBRWQCB Water Quality Control Plan surface water quality objectives is discussed below.
- **Substantially degrade water quality –** The analysis considers the potential for water quality changes caused by the Project to reduce the ability of the New and Alamo rivers to support aquatic species and recreation. This analysis also considers the potential for short-term degradation of water quality during construction, either through inadvertent releases of hazardous materials or erosion or sedimentation.

3.11.3.3 No Action Alternative

Under the No Action Alternative, the flow and salt loading to the Salton Sea will change relative to existing conditions because of changes in water use practices, as projected in the PEIR (DWR and DFG 2007). Sea salinity under No Action Alternative would be greater than under the existing conditions. Under the No Action Alternative, the Salton Sea would be sufficiently large in area and deep to maintain many of the physical and water quality characteristics of the existing conditions through 2020 (DWR and DFG 2007). Around 2020, the water column would be expected to stratify in the spring and early summer, which would allow an anoxic zone to form in the hypolimnion. The anoxic conditions and prolonged stratification would cause the production and accumulation of hydrogen sulfide and ammonia in these deeper waters. The deep waters also would be characterized by extremely low dissolved oxygen. When cooler temperatures and winds break the thermal stratification, the water column would become fully mixed. This condition would occur in late summer/early fall and would result in a serious degradation of water quality that would be toxic to aquatic life in the vicinity of this mixing event.

After 2020, the Salton Sea would become a shallower water body (DWR and DFG 2007). Less wind energy would be required to mix the water, and dissolved oxygen would extend to a larger portion of the water column in the shallower water body than under existing conditions. Therefore, the Salton Sea would be subject to greater and more frequent mixing events, less thermal stratification, and less accumulation of hydrogen sulfide and ammonia. In addition, simulations in the PEIR indicated there is considerably more orthophosphate throughout the water column in the No Action Alternative at 2040 and 2078 simulations than in the No Action Alternative at 2020 simulation. This result is influenced by the simulation's assumption that for the shallower Sea there is increased resuspension of orthophosphate from the bottom sediments and release of orthophosphate in the pore water (DWR and DFG 2007).

The large algal community would likely reduce dissolved oxygen levels. The most critical time would be in the early morning hours due to nighttime algal respiration. Model results from the PEIR indicate that early morning dissolved oxygen would be less than 2 mg/L (a value where many fish and wildlife would be stressed). However, the dissolved oxygen concentrations are anticipated to not cause long term anoxic effects in the shallow Salton Sea (DWR and DFG 2007).

Simulations in the PEIR (DWR and DFG 2007) included hydrologic conditions and future climate conditions for the 75-year PEIR study period. The hydrologic analysis was performed on an annual basis for the 2003 to 2078 period that was consistent with the implementation period for the QSA (see Section 3.11.3.1). A second hydrologic analysis was performed for the period 2018 to 2078 that represented conditions following the cessation of (c)(1) water, which is the transfer of 800,000 af of conserved water from IID to DWR (Fish and Game Code Section 2081.7(c)(1)), and conditions following the construction of major facilities under the alternatives (DWR and DFG 2007).

Inflows from Mexico simulated in the PEIR were based upon historical patterns adjusted for potential reductions in Colorado River water deliveries that would reduce agricultural return flows into the New and Alamo rivers, wastewater system improvements to the Mexicali II Service Area that would divert effluent to the Gulf of California, and recently constructed power plants that would use a portion of the New River flows for cooling water. Overall, inflows from Mexico under the No Action Alternative are expected to decrease to an average inflow of 98,000 afy for the 2003 to 2078 period, and 97,000 afy for the 2018 to 2078 period (DWR and DFG 2007).

Inflows from the Imperial Valley simulated in the PEIR also were based upon historical patterns adjusted for implementation of the QSA and IID Water Conservation and Transfer Project. Inflows from the Imperial Valley under the No Action Alternative are expected to decrease to an average inflow of 777,000 afy for the 2003 to 2078 period and 724,000 afy for the 2018 to 2078 period (DWR and DFG 2007).

Historical inflows from the Coachella Valley simulated in the PEIR also were adjusted for implementation of the QSA related projects and the Coachella Valley Water Management Plan (Coachella Valley Water District 2002, as cited in DWR and DFG 2007). Total average inflows from the Coachella Valley under the No Action Alternative are expected to increase to 126,000 afy for the 2003 to 2078 period and 138,000 afy for the 2018 to 2078 period (DWR and DFG 2007).

Inflows to the Salton Sea from local watersheds under the No Action Alternative are expected to be similar to the recent historical inflows.

The projected total average inflow to the Salton Sea under the No Action Alternative for the 2003 to 2078 period was estimated at about 965,000 afy with a minimum of 792,700 afy and a maximum of 1,303,300 afy (DWR and DFG 2007). The average inflow for 2018 to 2078 was calculated as 922,000 afy (DWR and DFG 2007).

The sequence of future climate conditions has been assumed to occur as it did in the past. Projected future 2003 to 2078 conditions for Imperial Valley and local watershed flows to the Salton Sea are based on the estimated climate conditions of the 1925 to 1999 historical sequence (primarily rainfall, evapotranspiration rates, and evaporation rates). Even if the climate is consistent with that during the historical period, the historical sequence would not reproduce identically in the future. For this reason, the inflow analysis for the No Action Alternative was developed using a statistical approach known as Monte-Carlo analysis to generate many possible future sequences (no adjustment to values, just sequence) based on the historic climate values and patterns. Using this approach, the future projections incorporate variability in climate conditions and can be viewed in a probabilistic fashion. The projected variability of total inflow to the Salton Sea could be up to 200,000 af in any one year (DWR and DFG 2007).

As water use within IID decreases, the flow in the New and Alamo rivers would be expected to decrease by approximately 305,670 afy, which would result in a declining water surface elevation in the Sea and an increasing salinity because of the concentrating effect of evaporation. Simulations in the PEIR (DWR and DFG 2007) showed water surface elevations declining and salt levels increasing under the No Action Alternative (Figure 3.11-9 and Figure 3.11-10) until 2046 when the surface elevation stabilizes at about -258.3 feet msl. The stabilized elevation would be about 6 feet lower than the 1925 elevation that the Salton Sea had declined to before rising in response to increased agricultural runoff. The simulations conducted for the PEIR suggest the current trend and show a remnant Salton Sea that would become a brine sink with salinity exceeding 100 ppt by 2024 and approximately 243 ppt by 2046 (DWR and DFG 2007).

As the Salton Sea's water surface elevation declines, the Sea's surface area will also decrease and, therefore, the total evaporation from the Sea will decrease. The water surface elevation eventually stabilizes when the water lost to evaporation equals the total inflow to the Sea. As the Sea declines, both the New and Alamo rivers will extend farther out into the Sea to reach the receding shoreline. The existing delta at both rivers will continue to form at the mouth of both rivers and be projected farther into the Sea. Finally, as the Sea elevation drops, the bed slope of the rivers at the Sea's edge will increase, leading to scour of moveable river bed sediments and possible formation of a head cut. Depending on the slope of the river projected out into the receding Sea compared to the existing channel bed slope (0.0003 foot per foot), such a head cut could migrate upstream in the existing channel, causing the water surface elevation in the river to drop. The presence of clay lenses below the channel bed may resist any head cut in the channels.

At the time of Project construction (late 2012), water quality conditions would likely be similar to those described under the Affected Environment above, with the exception of salinity, which has been steadily increasing in the Salton Sea, New River, and Alamo River since 1999. Declining inflows to the Sea in future years from various factors will result in collapse of the Sea's ecosystem due to increasing salinity and other water quality issues, such as temperature, eutrophication and related anoxia, selenium concentrations, and algal productivity. These changes reflect a substantial impact on water quality of the Salton Sea, New River, and Alamo River. Successful implementation of the TMDLs listed in Table 3.11-2 may improve water quality; however, most of the TMDLs listed have proposed completion dates of 2019 or 2021, which implies that water quality will not start improving until after those dates. By 2024, the Sea's salinity is projected to be 106 ppt (DWR and DFG 2007), which is significantly above the Water Quality Control Plan's objective of 35 ppt. Under the projected salinity trend, the Water Quality Control Plan's objective would not be met.

Compared with the existing conditions (conditions in 2010), the No Action Alternative reflects decreased water surface elevation and surface area of the Sea, and an increased salinity. The difference becomes pronounced at the end of the planning period in 2077 (Table 3.11-10).

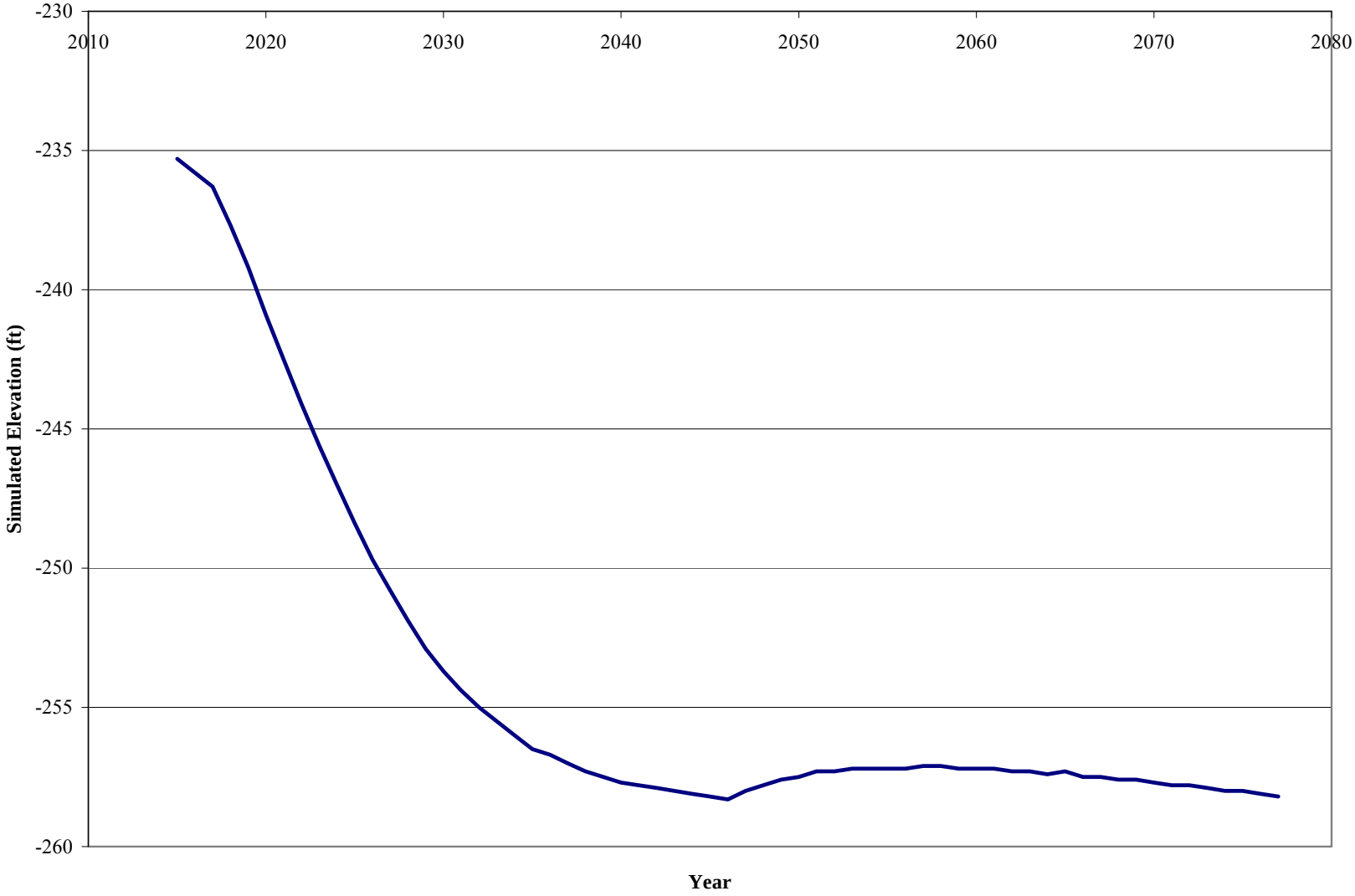


Figure 3.11-9 Simulated Salton Sea Elevation under the No Action Alternative

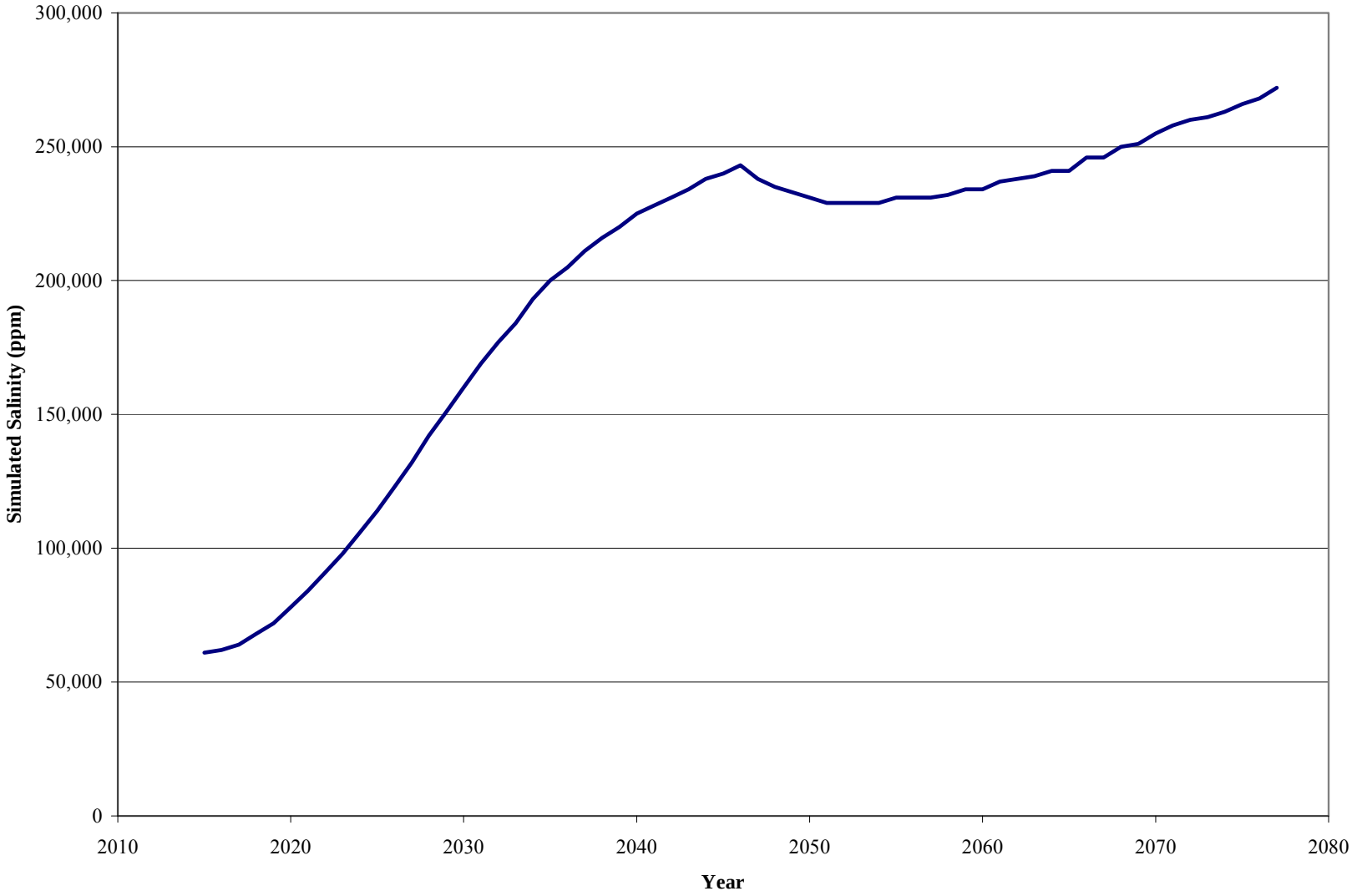


Figure 3.11-10 Simulated Salton Sea Salinity under the No Action Alternative

3.11.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact HYD-1: Project implementation would cause a reduction in the Salton Sea's water surface elevation (less-than-significant impact). The SCH ponds would lose about 72 inches of stored water to evaporation each year, similar to the adjacent Salton Sea. The total volume of water lost to evaporation would be equivalent to the evaporation rate multiplied by the surface area of the SCH ponds. For a surface area of the SCH ponds of 3,130 acres about 18,650 af of water would be lost from the ponds per year. In the absence of the Project, this volume of water would otherwise flow to the Sea where it would be subjected to a similar evaporation rate (but smaller because of the lake effect and the hypersaline conditions). As the Sea recedes, the surface area exposed to evaporation would decline, while the surface area of the ponds would remain constant. Thus, the difference between evaporation from the SCH ponds versus evaporation from the Sea relates to the changes in the Sea's surface area resulting from Project implementation.

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 223,770 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by 130,200 af compared to the No Action Alternative. The Sea's surface elevation would be about 0.8 foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth (water surface elevation minus the bottom elevation of the Sea) would be reduced by 4.3 percent, and its water surface elevation would be about 0.9 foot lower as a result of the SCH diversions. Table 3.11-10 compares the Salton Sea's water surface elevation, storage volume, and surface area that would occur in the absence of the Project with the Project at the onset of operations, the end of the proof-of-concept period, and the end of the Project's lifetime.

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 1 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 940 acres of playa.

Alternative 1 also would result in a change to the Salton Sea's water surface elevation when compared to existing conditions. Most of the change, however, would be a consequence of the changes in inflow to the Sea described above, and not related to the Project. Table 3.11-10 shows the changes from the existing conditions that occur under the No Action Alternative and a small increment associated with the Project. For example, by 2077 the water surface elevation of the Sea is expected to decline by 27.2 feet relative to existing conditions. While this is substantial change in elevation, all but 0.9 feet of the change would a result of the No Action Alternative. That is, the Sea will get smaller, shallower, and saltier regardless of whether the SCH Project is implemented or not, which expected to result in the collapse of the ecosystem. Alternative 1 would offset a portion of this lost habitat by providing new habitat that is usable by birds, fish, and other organisms. It would not, in itself, result in changes that would have an adverse effect on or preclude the beneficial uses of the Salton Sea identified in the Basin Plan. Impacts from the change in water surface elevation in the Salton Sea would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Table 3.11-10 Salton Sea Surface Elevation and Area – No Action[1] and SCH Project Alternatives

	Elevation			Storage			Area		
	2014 (ft)	2025 (ft)	2077 (ft)	2014 (af)	2025 (af)	2077 (af)	2014 (acres)	2025 (acres)	2077 (acres)
Existing[2]	-231.0	--	--	6,744,357	--	--	227,299	--	--
No Action	-234.7	-248.4	-258.2	5,867,592	3,183,010	1,648,221	219,785	169,467	141,723
Alternative 1	-234.8	-249.2	-259.1	5,848,945	3,052,854	1,528,033	219,541	166,929	139,529
Difference	-0.1	-0.8	-0.9	-18,647	-130,157	-120,188	-244	-2,538	-2,194
Alternative 2	-234.8	-249.0	-258.9	5,851,729	3,072,288	1,545,332	219,577	167,308	139,847
Difference	-0.1	-0.6	-0.7	-15,863	-110,723	-102,889	-208	-2,159	-1,875
Alternative 3	-234.8	-249.3	-259.2	5,845,137	3,026,286	1,504,769	219,493	166,413	139,097
Difference	-0.1	-0.9	-1.0	-22,455	-156,725	-143,451	-292	-3,054	-2,626
Alternative 4	-234.8	-249.1	-259.0	5,849,790	3,058,750	1,533,256	219,552	167,044	139,625
Difference	-0.1	-0.7	-0.8	-17,802	-124,260	-114,965	-233	-2,423	-2,098
Alternative 5	-234.8	-248.9	-258.8	5,855,222	3,096,671	1,567,375	219,621	167,785	140,251
Difference	-0.1	-0.5	-0.6	-12,370	-86,339	-80,846	-164	-1,682	-1,472
Alternative 6	-234.8	-249.1	-259.0	5,850,093	3,060,868	1,535,137	219,556	167,085	139,660
Difference	-0.1	-0.7	-0.8	-17,499	-122,143	-113,084	-229	-2,382	-2,063

Notes:
1. No Action modeled in PEIR, Appendix H-2, Attachment 2, Table H2-2-3 (DWR and DFG 2007)
2. Existing Conditions is represented by 2010 conditions.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). Because the diverted water would pass through the SCH ponds, losing water only to evaporation, both water and salt would be returned to the Sea. The SCH ponds would temporarily store a volume of salt, a portion of which would be continuously released back to the Sea and a portion that would be temporarily in storage. The amount in storage is related to the SCH salinity and the volume of the ponds, and the rate that is returned to the Sea depends on the residence time (2 to 32 weeks). The salt would only be stored temporarily; thus, the SCH ponds would not be a salt sink.

Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 3,130 acre pond, the Sea's salinity would increase relative to No Action by 4.3 percent (to 118.9 ppt) by 2025 and by 7.9 percent (to 293.4 ppt) by 2077. Table 3.11-11 compares the estimated salinity of the Salton Sea that would occur in the absence of the Project and with the Project at the onset of operations, the end of the proof-of-concept period, and the end of the Project's lifetime.

Alternative 1 also would result in a change to the Salton Sea's salinity when compared to existing conditions, but as shown in Table 3.11-11, the salinity of the Sea would be changing regardless of whether the SCH Project were implemented or not. Alternative 1 would offset a portion of the habitat that

will be lost as a result of the increasing salinity and would not, in itself, result in changes that would have an adverse effect on or preclude the beneficial uses of the Salton Sea identified in the Basin Plan. Impacts from the change in salinity in the Salton Sea would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Table 3.11-11 Salton Sea Salinity – No Action and SCH Project

	2014 (ppt)	2025 (ppt)	2077 (ppt)
Existing[1]	51.0	--	--
No Action	59.0	114.0	272.0
Alternative 1	59.2	118.9	293.4
Percent Change	0.3%	4.3%	7.9%
Alternative 2	59.2	118.1	290.1
Percent Change	0.3%	3.6%	6.7%
Alternative 3	59.2	119.9	297.9
Percent Change	0.4%	5.2%	9.5%
Alternative 4	59.2	118.6	292.4
Percent Change	0.3%	4.1%	7.5%
Alternative 5	59.1	117.2	286.0
Percent Change	0.2%	2.8%	5.2%
Alternative 6	59.2	118.5	292.0
Percent Change	0.3%	4.0%	7.4%

[1] Existing Conditions is represented by 2010 conditions.

This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HYD-3: Project operations would cause changes in Salton Sea water quality but would not violate established standards (less-than-significant impact). As discussed in Section 3.11.3.2, Regulatory Requirements, the CRBRWQCB has established general surface water quality objectives, including TMDLs, for surface waters of the Colorado River Basin region. The Project's impacts in relation to each of these objectives are discussed.

Sedimentation/Siltation. Under Alternative 1, a portion of the New River's flow would be diverted through the sedimentation basins to allow sediment to settle out prior to conveyance and delivery of water to the SCH habitat ponds. Routine operations would include the removal and disposal of the sediments collected in the sedimentation basin. The resulting discharge from the SCH ponds to the Salton Sea would have a reduced sediment load, and thus would the Project would contribute to meeting the sedimentation/siltation TMDL standard (CRBRWQCB 2002b). Therefore, the impact of the Project would be less than significant compared to existing conditions and the No Action Alternative.

Salinity. The salinity of the Salton Sea already exceeds the Basin Plan objective (it currently is approximately 51 ppt, whereas the objective is 35 ppt). As shown in Table 3.11-11, the salinity of the Sea is projected to increase regardless of whether the Project is implemented. The Project would result in an incremental increase in salinity over time, but this incremental increase would be less than significant when compared to both the existing condition and the No Action Alternative (also refer to the discussion under Impact HYD-2).

Selenium. Existing (2004-2009) mean selenium concentrations in the New River are 3.28 µg/L (C. Holdren, Reclamation, unpublished data). These concentrations have varied little over recent years, and would be expected to be similar over the next few years. Under future conditions modeled for the PEIR, selenium concentrations would increase by 2077, but would not exceed 10 µg/L (DWR and DFG 2007).

Under Alternative 1, a portion of the New River's selenium-laden flow would be diverted through the ponds before discharging to the Sea. The SCH ponds would be operated using blended inflow water with a selenium concentration between the New River (mean < 3.5 µg/L) and Salton Sea (< 2 µg/L). For 20 ppt salinity (this would be the worst-case scenario for selenium under existing conditions and near-term conditions), the inflow selenium concentration would be 2.6 µg/L (Sickman et al. 2011). Shortly after the ponds are constructed and first filled with water, selenium concentrations in the ponded water would be expected to increase due to solubilization of oxidized selenium from the rewetted playa sediments (Amrhein et al. 2011, summarized in Appendix I). Selenium concentrations in overlying water (approximately 1 meter deep) could increase by approximately 0.9 µg/L (Amrhein et al. 2011). The total load of selenium solubilized and released to the Salton Sea would depend on the amount of playa sediments exposed and oxidized (this increases each year as the Sea recedes), available iron oxides in sediments (these bind selenium and reduce the amount solubilized in water) (Amrhein et al. 2011), and the size of the ponds that would be constructed and inundated. However, this "flush" would be temporary and would likely decline over the first 1 to 2 years. This is supported by findings from the Reclamation/USGS Saline Habitat Ponds, where water selenium concentration and the frequency of elevated egg selenium concentrations declined after the first year (Miles et al. 2009). Sickman and others (2011) suggested that saline wetlands at the Salton Sea appear to develop selenium removal pathways (i.e., volatilization or sequestration) within the first 1 to 2 years after construction. Reducing water retention time and increasing flow-through of the ponds for several weeks or months following initial filling could be used to flush soluble selenium from the ponds (Amrhein et al. 2011).

If there is minimal selenium removal within the ponds, the selenium concentration of the discharge would be 2.6 µg/L under existing and expected near-term No Action conditions, and potentially elevated by approximately 0.9 µg/L during the initial wetting period. These levels would still be below the water quality objective of 5 µg/L. In the future, however, the discharge may exceed this standard, depending on the water blending ratios needed to achieve suitable salinities (Sea salinity is increasing, so would use less low-selenium Sea water) and the future selenium concentrations in the river (up to 10 µg/L possible). Nevertheless, this concentration would be lower than the concentration of New River water directly flowing to the Salton Sea.

In conclusion, there would likely be an increase in total selenium load reaching the Sea compared to the existing conditions and No Action Alternative. This increase, however, would be temporary and the relative magnitude of selenium load compared to the amount present in river-source water would likely not be significant. The selenium discharged to the Sea would be diluted and assimilated, given the Sea's much greater volume and its assimilative capacity in its anoxic sediments, and therefore Alternative 1 would not appreciably affect the Sea's selenium loading or waterborne concentrations. Therefore, the impact would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Dissolved Oxygen. Operation of the SCH ponds under Alternative 1 would use nutrient-rich New River water blended with Salton Sea water. Water quality modeling (B. Barry and M. Anderson, University of California Riverside, unpublished data) indicates that the ponds would sustain high primary productivity, with phytoplankton blooms in March–May and October. This high primary productivity would result in periods of anoxia both daily (near dawn due to respiration of all organisms present) and seasonally (especially in spring and fall). SCH pond water discharged to the Salton Sea during these anoxic periods would have lower levels of dissolved oxygen, potentially lower than the CRBRWQCB (2006) water quality objective of 5 mg/L, but this would be offset by aeration that would occur as it cascades from the outfall structure. Furthermore, this lowering of dissolved oxygen would have only a localized effect that would be quickly dissipated in the larger Sea, assisted by wave action. Therefore, the effect would be less than significant compared to the existing conditions and the No Action Alternative.

Nutrients. Operation of the SCH ponds under Alternative 1 would include the blending of New River water and Salton Sea water. Total phosphorus concentration in the SCH pond water would be greater than in the Salton Sea (> 122 µg/L), but less than in the New River (< 1,031 µg/L). The concentration of total phosphorus in SCH pond water discharged into the Salton Sea would exceed the draft numeric target of 35 µg/L (0.035 mg/L), but this exceedance already occurs for river water discharging directly to the Sea. Any potential effect would be localized and temporary because the pond discharge would be rapidly dissipated in the considerably larger volume of the Sea. Therefore, when compared to both the existing environmental setting and the No Action Alternative, outflow of water that is high in phosphorus concentrations from the SCH ponds to the Salton Sea would have a less-than-significant impact.

Impact HYD-4: Construction of the SCH ponds would degrade water quality at the Salton Sea (less-than-significant impact). Project construction would last approximately 2 years, during which time sediment and other constituent loads might be increased into the Salton Sea and New River. Construction would temporarily increase suspended sediment and nutrient cycling in waters near active construction. Resuspended bottom sediments would allow release previously deposited water-soluble contaminants and nutrients. Release of phosphorus would temporarily stimulate local algae production and reduce water quality conditions. With regard to pesticides, disturbance of bottom sediments in those areas where berm construction and grading of swales would occur would redistribute buried DDT residues to the surface and release pyrethroid pesticides into the water column, particularly at East New River. Pyrethroid pesticides (Fojut and Young 2011), as well as DDT and residues, are highly hydrophobic, however, and would likely remain bound to disturbed sediments that would remain in the ponds and berms. In addition, potential inadvertent releases of hazardous materials into nearby waters during construction would temporarily degrade water quality at the Salton Sea. Generally, these potential impacts would be short-term and limited to the duration of construction.

The Project would include an Erosion and Sediment Control Plan and a Stormwater Pollution and Prevention Plan for construction and maintenance activities. These plans would address the potential for erosion and incorporate appropriate protections into the design. Although DDT residues could remain in the surface sediments beyond the 2-year construction period, concentrations would likely be similar to elevated concentrations already present in several other nearby habitats. Resuspension and redistribution of almost exclusively sediment-bound pyrethroids would unlikely increase pyrethroid toxicity over existing levels, based on ongoing input of pyrethroids from agricultural drainage and pesticide concentrations currently measured in waters entering the Salton Sea. Therefore, the effect would be less than significant compared to the existing conditions and the No Action Alternative.

Impact HYD-5: Berm failure could increase erosion and sedimentation of the adjacent river and the Salton Sea (less-than-significant impact). The SCH ponds would have both interior and exterior berms. There would be a potential for berm failure to occur as a result of a seismic event, seiche, flood event, or other similar factor. The volume of sediment would be about the size of the eroded portion of

the berm. If an interior berm failed, sediment would enter the SCH ponds and would not affect other water bodies. If an exterior berm failed, this failure would not affect nearby canals or drains because the berms would be downgradient, and any water released from the ponds would flow away from them, toward the Salton Sea. Impacts on the Salton Sea would be short-term, lasting only for several days. If a large-scale berm failure occurred, water would be released through the breach and would either enter the Sea directly (in the near-term) or would be released onto the exposed playa (in the future). If a smaller breach occurred, the ponds would be drained both through the breach and through the release of water through the control valve. This release also would occur over several days. Sediment released into the Sea would settle near the ponds and would not have a substantial effect on water quality. Impacts on the New River would occur only if a berm failed in the immediate vicinity of the river. This type of failure is unlikely because of the elevation of the existing ground is above -228 feet, but should this occur, the sediment would temporarily degrade water quality of a short segment of the river, and the sediment would flow to the Sea. The berms would be repaired promptly, and impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

3.11.3.5 Alternative 2 – New River, Pumped Diversion

Impact HYD-1: Project implementation would cause a reduction in the Salton Sea's water surface elevation (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. For a surface area of the SCH ponds of 2,670 acres about 15,860 af of water would be lost from the ponds per year. In the absence of the Project, this volume of water would otherwise flow to the Sea where it would be subjected to a similar evaporation rate.

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 190,350 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by 110,700 af compared to the No Action Alternative. The Sea's surface elevation would be about 0.6 foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 3.7 percent, and its water surface elevation would be about 0.7 foot lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 2 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 790 acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 2,670 acre pond, the Sea's salinity would increase relative to No Action by 3.6 percent (to 118.1 ppt) by 2025 and by 6.7 percent (to 290.1 ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HYD-3: Project operations would cause changes in Salton Sea water quality but would not violate established standards (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HYD-4: Construction of the SCH ponds would temporarily degrade water quality at the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HYD-5: Berm failure could increase erosion and sedimentation of the adjacent river and the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.11.3.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact HYD-1: Project implementation would cause a reduction in the Salton Sea's water surface elevation (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. For a surface area of the SCH ponds of 3,770 acres about 22,460 af of water would be lost from the ponds per year. In the absence of the Project, this volume of water would otherwise flow to the Sea where it would be subjected to a similar evaporation rate.

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 269,460 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by 156,700 af compared to the No Action Alternative. The Sea's surface elevation would be about 0.9 feet lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 5.1 percent, and its water surface elevation would be about 1.0 foot lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 3 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 1150 acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 3,770-acre pond, the Sea's salinity would increase relative to No Action by 5.2 percent (to 119.9 ppt) by 2025 and by 9.5 percent (to 297.9 ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HYD-3: Project operations would cause changes in Salton Sea water quality but would not violate established standards (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HYD-4: Construction of the SCH ponds would temporarily degrade water quality at the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HYD-5: Berm failure could increase erosion and sedimentation of the adjacent river and the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.11.3.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact HYD-1: Project implementation would cause a reduction in the Salton Sea's water surface elevation (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. For a surface area of the SCH ponds of 2,290 acres about 13,640 af of water would be lost from the ponds per year. In the absence of the Project, this volume of water would otherwise flow to the Sea where it would be subjected to a similar evaporation rate.

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 163,650 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by 124,260 af compared to the No Action Alternative. The Sea's surface elevation would be about 0.7 foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 4.1 percent, and its water surface elevation would be about 0.8 foot lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 4 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 194 acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 2,290 acre pond, the Sea's salinity would increase relative to No Action by 4.1 percent (to 118.6 ppt) by 2025 and by 7.5 percent (to 292.4 ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HYD-3: Project operations would cause changes in Salton Sea water quality but would not violate established standards (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, with the exception that Alamo River water would be used in the SCH ponds instead of New River water. The Alamo River currently has higher total selenium (current mean 5.39 µg/L) and lower total phosphorus concentrations (681 µg/L) than the New River. For ponds managed at 20 ppt salinity, the inflow selenium concentration would be 4.0 µg/L (Sickman et al. 2011). If there is minimal selenium removal within the ponds, the selenium concentration of the discharge would be 4.0 µg/L under existing and expected near-term No Action conditions, potentially temporarily elevated by approximately 0.9 µg/L due to selenium solubilization from the oxidized sediments following the initial wetting period. These concentrations exceed levels in the Salton Sea, but discharge of SCH pond water would be dissipated and diluted in the Sea's greater volume. Therefore, the water quality impact on the Sea would be less than significant when compared to the existing environmental setting and the No Action Alternative.

Impact HYD-4: Construction of the SCH ponds would temporarily degrade water quality at the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HYD-5: Berm failure could increase erosion and sedimentation of the adjacent river and the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.11.3.8 Alternative 5 – Alamo River, Pumped Diversion

Impact HYD-1: Project implementation would cause a reduction in the Salton Sea's water surface elevation (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. For a surface area of the SCH ponds of 2,080 acres about 12,370 af of water would be lost from the ponds per year. In the absence of the Project, this volume of water would otherwise flow to the Sea where it would be subjected to a similar evaporation rate.

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 148,440 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by 86,300 af compared to the No Action Alternative. The Sea's surface elevation would be about 0.5 foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 2.9 percent, and its water surface elevation would be about 0.6 foot lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 5 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 600 acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 2,080 acre pond, the Sea's salinity would increase relative to No Action by 2.8 percent (to 117.5 ppt) by 2025 and by 5.1 percent (to 286.0 ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HYD-3: Project operations would cause changes in Salton Sea water quality but would not violate established standards (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, with the exception that Alamo River water would be used in the SCH pondwater instead of New River water.

Impact HYD-4: Construction of the SCH ponds would temporarily degrade water quality at the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HYD-5: Berm failure could increase erosion and sedimentation of the adjacent river and the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.11.3.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact HYD-1: Project implementation would cause a reduction in the Salton Sea's water surface elevation (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. For a surface area of the SCH ponds of 2,940 acres about 17,500 af of water would be lost from the ponds per year. In the absence of the Project, this volume of water would otherwise flow to the Sea where it would be subjected to a similar evaporation rate.

From the initial Project operation in 2014 through the end of the proof-of-concept period in 2025, a total of approximately 209,990 af of water would be lost to evaporation from the SCH ponds. This loss would be partially offset by the decrease in evaporation from the Sea because the storage (and therefore the surface area of the Sea) would be less because of the SCH diversion. By 2025, the volume of water stored in the Sea would be reduced by 122,143 af. The Sea's surface elevation would be about 0.7 foot lower because of the ongoing evaporation that would result from Project operations.

By 2077, the Sea's depth would be reduced by 4.0 percent, and its water surface elevation would be about 0.8 feet lower as a result of the SCH diversions (Table 3.11-10).

The SCH ponds would cover playa exposed under the No Action Alternative and by 2077 although Alternative 6 results in a smaller remnant Sea, the net effect of the alternative is to cover an additional 880 acres of playa.

Impact HYD-2: Project implementation would increase the Salton Sea's salinity (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. Although the total salt load of the Sea would not change as a result of the Project, the volume of water in the Sea would be reduced because of the increased rate of evaporation in the SCH ponds (refer to Impact HYD-1). Therefore, for a 2,940 acre pond, the Sea's salinity would increase relative to No Action by 4.0 percent (to 118.5 ppt) by 2025 and by 7.4 percent (to 292.0 ppt) by 2077 (Table 3.11-11). This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact HYD-3: Project operations would cause changes in Salton Sea water quality but would not violate established standards (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, with the exception that Alamo River water would be used in the SCH pondwater instead of New River water.

Impact HYD-4: Construction of the SCH ponds would temporarily degrade water quality at the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact HYD-5: Berm failure could increase erosion and sedimentation of the adjacent river and the Salton Sea (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

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Wang, W., L. Delgado-Moreno, J. Conkle, and J. Gan. 2011. Survey of pesticide contamination in sediments at prospective SCH sites. Report prepared for the Department of Water Resources. May 28.

3.11.5 Personal Communications

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Gutierrez, David. 2011. Chief, Division of Safety of Dams, letter to Kent Nelson regarding Salton Sea Ponds Dam, Proposed, Imperial County. March 23.

Holdren, Chris. Bureau of Reclamation's Environmental Applications and Research Group. 2010.

3.12 INDIAN TRUST ASSETS

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian tribes or individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust. Examples of objects that may be trust assets are lands (including tribal trust, fee title, and allotee land); minerals; hunting and fishing rights, and water rights. While most ITAs are on reservations, they may also be found off-reservations. The United States has a trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and executive orders. These are sometimes further interpreted through court decisions and regulations. The only tribe identified as potentially having ITAs in the Species Conservation Habitat Project area is the Torres Martinez Desert Cahuilla Indians. The Torres Martinez Desert Cahuilla Indians' Reservation is located on approximately 24,000 acres along the northern shore of the Salton Sea. Communication with the tribe confirmed that there are no ITAs in the Species Conservation Habitat Project area or nearby vicinity (personal communication, R. Ferrer 2010); therefore, no impacts on ITAs would occur under any of the Project alternatives.

3.12.1 Personal Communications

Ferrer, Roland. 2010. Planning Director, Torres Martinez Desert Cahuilla Indian Tribe Planning Department. Personal communication with Megan Schwartz, Cardno ENTRIX, November 8.

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3.13 LAND USE

3.13.1 Introduction

This section addresses potential conflicts of the Species Conservation Habitat (SCH) Project with existing and future planned land uses and relevant land use plans and policies. Impacts associated with the potential for conversion of agricultural land to non-agricultural use and conflicts with agricultural zoning are addressed in Section 3.2, Agricultural Resources. Impacts on recreational land uses are addressed in Section 3.18, Recreation. The study area includes the land at the mouths of the New and Alamo rivers that could be restored as part of the SCH Project, as well as adjacent areas that could be affected by construction, operations, or maintenance.

Table 3.13-1 summarizes the impacts of the six Project alternatives on land use, compared to both the existing conditions and the No Action Alternative.

Table 3.13-1 Summary of Impacts on Land Use

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact LU-1: Given the implementation of mitigation measures identified in other sections of this Environmental Impact Statement/Environmental Impact Report, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans or policies.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact LU-2: Restoration of habitat for birds that are dependent on the Salton Sea would not result in substantive conflicts with existing adjacent land uses.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.13.2 Regulatory Requirements

3.13.2.1 State Programs and Regulations

The California State Lands Commission (SLC) manages State-owned lands that underlie California's navigable and tidal waterways. The State holds these lands, known as "sovereign lands," for the benefit of all the people of the state, subject to the Public Trust for water-related commerce, navigation, fisheries, recreation, open space and other recognized Public Trust uses." The SLC has determined that one parcel (010-020-030, shown on Figure 1-2) is included as part of Alternatives 4 and 6 and would be subject to a lease for the use of sovereign lands.

3.13.2.2 Regional Land Use Plans and Policies

Southern California Association of Governments – Regional Comprehensive Plan

The Southern California Association of Governments (SCAG) functions as the Metropolitan Planning Organization for six counties, including Imperial County. In 2008, SCAG adopted the Regional Comprehensive Plan (RCP) to provide a regional framework for decisions regarding growth in Southern California. The RCP identifies regional issues of importance, such as housing, traffic/transportation, and water and air quality, and incorporates information from other relevant plans. It also contains a number of goals and policies applicable to regional development and identifies methods for their implementation. The RCP identifies the Salton Sea Basin as an area of concern for air quality, and mentions that it is one of the water bodies in the region where water quality needs to be protected. Use of the information contained in the RCP in local planning decisions is voluntary (SCAG 2008).

3.13.2.3 Local Land Use Plans and Policies

Imperial County General Plan

The Imperial County General Plan consists of ten elements: Land Use (2008); Housing (2008); Circulation and Scenic Highways (1993); Noise (1997); Seismic and Public Safety (1993); Agricultural, Conservation and Open Space, Geothermal/Alternative Energy and Transmission, Parks and Recreation, and Water. The Imperial County General Plan was updated in 2008. The General Plan Land Use Map designates land use categories and identifies locations appropriate for each use, as well as describes the anticipated maximum allowable buildout for the county (County of Imperial 2008a).

The Land Use Element of the General Plan is the primary policy statement for implementing development policies in the county's unincorporated portions. The goals and policies in the Land Use Element (listed in Table 3.13-2 below) promote the economic prominence of agricultural enterprises, determine appropriate urban development centers and encourage their economic development, protect the existing character of rural and recreational communities and areas, and preserve the unique natural and cultural resources of the Imperial Valley. The Land Use Element identifies the Salton Sea as a potential additional recreational site.

The General Plan includes provisions to maintain the Salton Sea for the disposal of agricultural and natural drainage, fish and wildlife habitat, and water-based recreation. The General Plan also includes a provision to maintain the salinity in the Salton Sea at 40,000 milligrams per liter or less to support habitat and recreational uses.

The Imperial County General Plan includes the Geothermal/Alternative Energy and Transmission Element as an optional element, as permitted by California Government Code section 65303, because of the importance of geothermal energy in the county. The purpose of the element is to provide a comprehensive document that contains the latest knowledge about the resource, workable development technology, legal requirements, policy, and implementation measures. The element provides a framework for the review and approval of geothermal projects in the county. This element encourages the development of geothermal resources in a manner compatible with the protection of agricultural and environmental resources.

Other sections of the General Plan also include objectives that support the viability of agricultural lands and water quality improvement in polluted water bodies including the Salton Sea.

Imperial County Land Use Ordinance

Division 5, *Zoning Areas Established*, of the Land Use Ordinance was adopted November 24, 1998, and last amended in 2008 (County of Imperial 2008b). The purposes of this ordinance are to protect the public health, safety, and welfare; to provide for the orderly development, classification, regulation and, where applicable, segregation of land uses; to regulate the height and size of buildings; to regulate the area of yards and other open spaces around buildings; to regulate the density of population; and to provide the economic and social advantages resulting from orderly planned land uses and resources. These purposes are accomplished through the classification of every lot or parcel of land within county's unincorporated area in one of the base zoning areas established in section 90501.

Zones classifying land that could be included in the SCH Project include:

S-1 (Open Space/Recreational) Zone – The purpose of the S-1 zone is to designate areas that recognize the unique Open Space and Recreational character of Imperial County including the deserts, mountains, and water front areas. Primarily the S-1 Zone is characterized by low-intensity human utilization and small-scale recreation-related uses.

A-2 (General Agriculture) Zone – The purpose of the A-2 Zone is to designate areas that are suitable and intended primarily for agricultural uses (limited) and agriculture-related compatible uses. Forty acres is the minimum lot size.

A-3 (Heavy Agriculture) Zone – The purpose of the A-3 Zone is to designate areas that are suitable for agricultural land uses, to prevent the encroachment of incompatible uses onto and within agricultural lands, and to prohibit the premature conversion of such lands to nonagricultural uses. It is a land use that is to promote the heaviest of agricultural uses in the county's most suitable land areas. Uses in the A-3 zoning designation are limited primarily to agriculture-related uses and agricultural activities that are compatible with agricultural uses.

M-2 (Medium Industrial) Zone – The purpose of the M-2 Zone is to designate areas for wholesale commercial, storage, trucking, assembly type manufacturing, general manufacturing, research and development, medium-intensity fabrication, and other similar medium-intensity processing facilities. The processing or fabrication within any of these facilities is to be limited to activities conducted either entirely within a building or within securely fenced (or obscured fencing) areas. Provided further that such facilities do not omit fumes, odor, dust, smoke, or gas beyond the confines of the property line within which their activity occurs, or produce significant levels of noise or vibration beyond the perimeter of the site.

Overlay zoning area boundaries are established in some places to further refine, classify, regulate, restrict, and segregate the use of land and buildings. Those applicable to the study area are:

- **G (Geothermal Overlay)**. The County Land Use Ordinance (section 91701.09) includes the Geothermal Overlay ("G") Zone, which permits minor geothermal projects and wells; and, by Conditional Use Permit, allows major and intermediate geothermal projects, geothermal test facilities, and major geothermal exploratory wells. The definitions of such projects follow:
    - Minor project: maximum of one production and one injection well; maximum resource flow of 100 gallons per minute (gpm) (or 50,000 pounds per hour).
    - Intermediate project: more than one production well and fewer than six wells; more than 100 gpm, but less than 2,000 gpm.

- Major project: more than six wells (production or injection in any combination); resource flow of more than 2,000 gpm, or 1 million pounds per hour.

- **PE (Pre-Existing Allowed/Restricted).** Land classified in the "PE" (Pre-Existing Allowed/Restricted) zone is also classified in another zone. The intent of the "PE" designation following the base use designation is to allow an existing base zoned use to continue with its current use, even though through the strict interpretation of the General Plan and Zoning Ordinances, such use is a Pre-Existing, nonconforming use. The intent is to allow the owner/operator of such an identified use to continue to operate such use, maintain and modify the structural facilities as required under the Health and Safety Codes to enlarge the facilities by no more than 30 percent of its current assessed value, and to replace such a facility should it be destroyed by fire, flood, or act of God.

The New River pond areas are zoned S-1 and S-1G (Figure 3.13-1). The area in which the brackish water pipeline leading from the New River to the pond sites would be located under Alternative 1 is zoned S-1, A-3, and A-3G. The area where the distribution line providing electrical power to the SCH Project would be located under Alternatives 1, 2, and 3 is zoned A-3 (the location of existing and proposed power lines is shown on Figure 2-5). The Alamo River pond areas are zoned S-1G (Figure 3.13-2). The area in which the brackish water pipeline leading from the Alamo River to the pond sites would be located under Alternative 4 is zoned S-1G in the northwestern corner, M-2G and M-2G-PE in the north-central portion, and A-2G and A-3G in the southern portion (County of Imperial 2008b). The area where the distribution line providing electrical power to the SCH Project would be located for Alternatives 4, 5, and 6 is zoned S-1G.

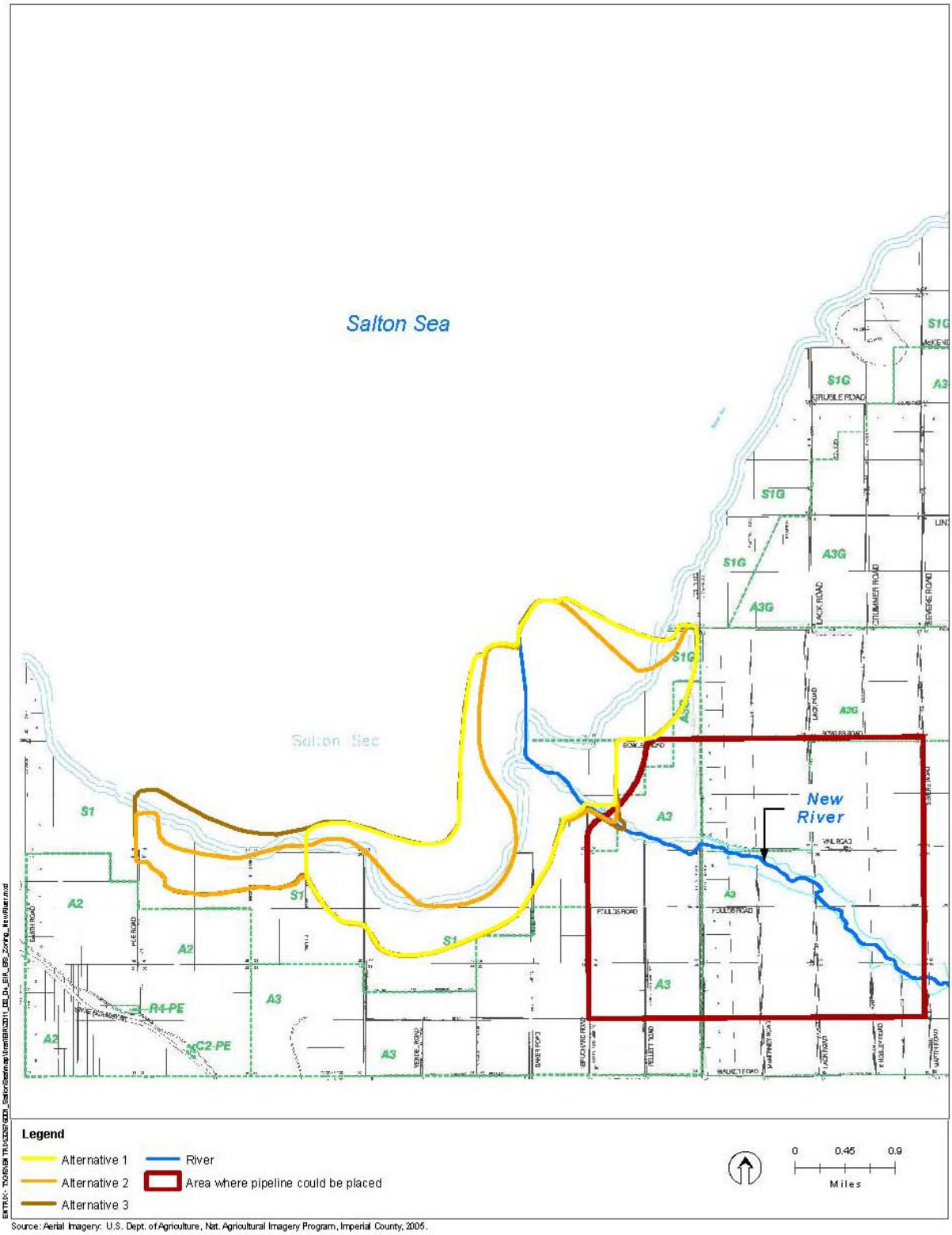
3.13.3 Affected Environment

Primary land uses within the study area include agriculture, energy production, recreation, and wildlife management areas. These uses are described in further detail below and are shown on Figure 3.13-3. Calipatria, Westmorland, and Niland are the closest urban areas to the SCH area and each is approximately 5 to 6 miles from the Project site(s). The pond sites are owned by IID, although portions of them are leased to the United States Fish and Wildlife Service (USFWS), which manages the NWR. The land in the area where brackish water pipelines could be constructed generally is under private ownership, although portions are owned by IID. Approximately 79,000 acres of land under and immediately adjacent to the Salton Sea are withdrawn from the public domain by the United States Bureau of Reclamation.

3.13.3.1 Salton Sea

The Salton Sea covers approximately 7.2 percent of the Imperial County land area (County of Imperial 2008a) and is California's largest lake with approximately 360 square miles of water surface and 105 miles of shoreline. The Sea's surface elevation lies approximately 232 feet below sea level, its maximum depth is 51 feet, and the total volume is about 7.5 million acre-feet (State Water Resources Control Board 2010; SSA 2010). The Sea occupies a desert basin known as the Salton Sink, which has flooded and receded periodically over geologic history as the Colorado River has shifted course. The current body of water formed between 1905 and 1907 when repeated flooding from the Colorado River caused levee breaks and flows to settle into the Salton Sink. Since its formation in 1905, the Sea has been sustained predominantly by drainage flows from the nearly 600,000 acres of irrigated farmland in the Coachella and Imperial valleys. The Sea also receives urban runoff and wastewater flows from the Mexicali and Imperial valleys via the New and Alamo rivers.

The Salton Sea and adjacent areas support diverse wildlife habitats for over 400 bird species. The Sea serves as important stop and wintering area for birds that migrate within the 5,000-mile international Pacific Flyway. The Sea is also a regional recreational resource for camping, fishing, boating, hunting, and bird watching. However, increasing salinity over the years and other water quality problems have been curtailing recreational use in the area.



Source: Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.13-1 Zoning Designations near the New River

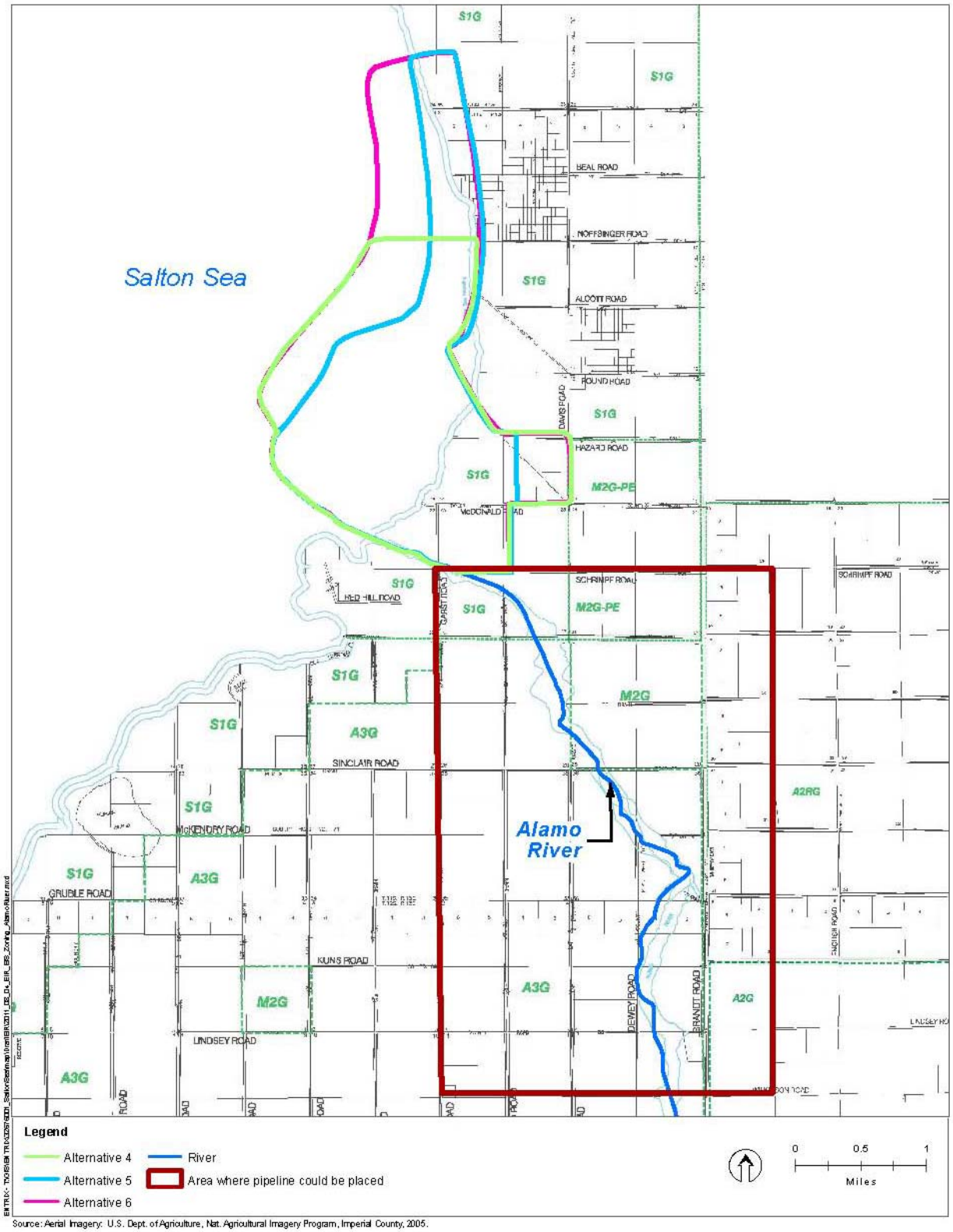


Figure 3.13-2 Zoning Designations near the Alamo River

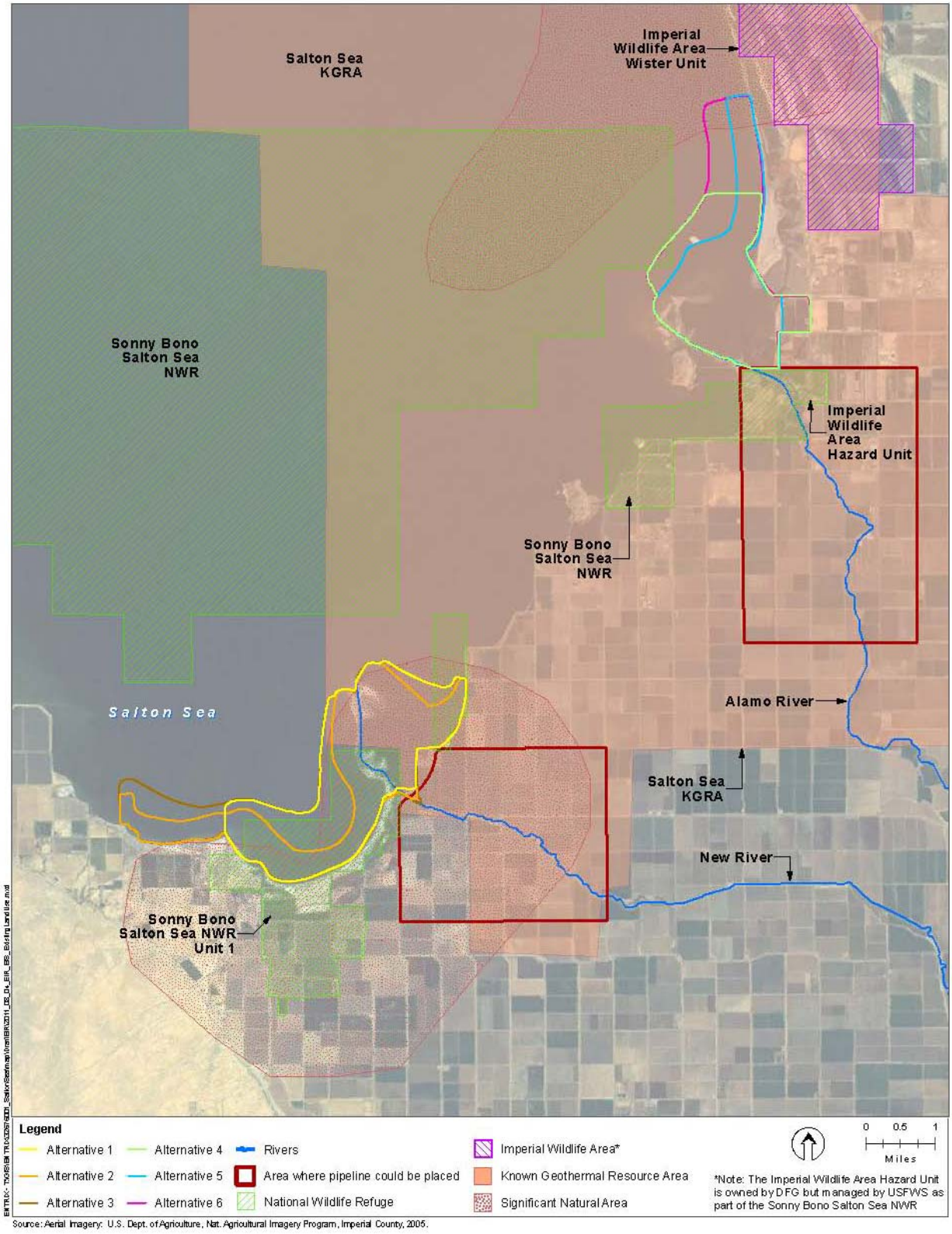


Figure 3.13-3 Existing Land Uses near the New and Alamo Rivers

3.13.3.2 Agricultural Lands

Agricultural lands are adjacent to the proposed pond sites at the New River, except for a portion that is a wetland managed for wildlife at the NWR. The area where the brackish water pipeline leading from the New River to the pond sites could be located is primarily agricultural land (Alternative 1 only). The Alamo River ponds would not be immediately adjacent to agricultural uses, but the potential brackish water pipeline area (Alternative 4 only) is composed primarily of agricultural land, except in the northwestern corner.

3.13.3.3 Natural Resource Areas

Sonny Bono Salton Sea National Wildlife Refuge

The NWR is located on the Salton Sea's southern end and was established in 1930 as a 32,766-acre sanctuary and breeding ground for birds and other wildlife. The NWR is intended as "...a refuge and breeding ground for birds and wild animals..." (Executive Order 5498, dated November 25, 1930, as cited in USFWS 2010); "... for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (16 United States Code[USC] section 715d, Migratory Bird Conservation Act, as cited in USFWS 2010); and "... for the management and control of migratory waterfowl and other wildlife..." (16 USC section 695, Lea Act, as cited in USFWS 2010).

Over time, agricultural runoff into the Salton Sea increased, gradually inundating the land that had been set aside for the NWR. Today, most of the NWR is submerged beneath the lake, and only 2,500 acres are managed as part of the NWR. Of the 2,500 acres, 920 acres are managed as wetlands to support resident shorebirds, seabirds, and other water-dependent bird species; the remaining acreage is included in dikes, shoreline, nesting islands, and saltflats. The managed areas are split into two units approximately 18 miles apart. Each unit contains managed wetland habitat to support shorebirds, seabirds, and other water-dependent bird species, as well as areas of intensely managed crop fields (USFWS 2010).

Public uses include waterfowl hunting, wildlife observation, photography, environmental education, interpretation, and research. Photo blinds and elevated observation platforms provide opportunities for wildlife observation and photography, and interpretive trails provide information about the existing habitats and associated species (USFWS 2010).

Imperial Wildlife Area

Owned by the DFG, Imperial Wildlife Area is composed of three units: Wister Unit, Hazard Unit, and Finney-Ramer Unit, covering 7,929 acres (DFG 2010). Finney-Ramer Unit and Hazard Unit are both traversed by the Alamo River, and Hazard Unit is a unit of the NWR (USFWS 2009). Although it is owned by DFG, the NWR has maintained management and administrative authority of these lands for decades by agreement with DFG. Recreational uses of Imperial Wildlife Area include boating, fishing, waterfowl and quail hunting, and overnight camping (DFG 2010).

Significant Natural Areas

The Imperial County Conservation and Open Space Element of the General Plan (2008) identifies Significant Natural Areas (SNAs) within the county. The New River SNA covers much of the area where the East New and West New ponds would be located, as well as most of a portion of the adjoining area near the New River proposed pond sites. The Mullet Island SNA encompasses Mullet Island and Wister Unit, and includes a portion of the Wister Beach ponds that would be part of Alternatives 5 and 6. The Conservation and Open Space Element includes a program to identify such areas and rezone them to limit development to low-intensity uses that are compatible with resource conservation. All projects within or

in the vicinity of an SNA should be designed to minimize adverse impacts on the biological resources it was created to protect.

3.13.3.4 Geothermal Energy Production

The Project area east of the New River is located in the Salton Sea Known Geothermal Resource Area (KGRA) (County of Imperial 2006). A KGRA is defined as:

> An area in which the geology, nearby discoveries, competitive interests, or other indicia would, in the opinion of the Secretary of the Interior, engender a belief in those who are experienced in the subject matter that the prospects for extraction of geothermal steam or associated geothermal resources are good enough to warrant expenditures of money for that purpose (30 USC 1001).

Geothermal production wells tap into water reservoirs thousands of feet beneath the earth's surface, releasing superheated water, which drives turbines to generate electricity.

Imperial County, through the Planning and Development Services Department, regulates the use of land for geothermal purposes through zoning and conditional use permits. The County Land Use Ordinance includes the Geothermal Overlay Zone, which is applied by ordinance of the Board of Supervisors, following a recommendation by the County Planning Commission, as shown on Figures 3.13-1 and 3.13-2 and discussed above, portions of the Project area are included in a Geothermal Overlay Zone.

A number of energy companies maintain geothermal plants, wells, and other facilities throughout the study area, including several CalEnergy facilities near the Alamo River.

3.13.3.5 Future Land Uses in the Study Area

Geothermal Energy Production

As noted above, the proposed pond sites are located in an area that contains important geothermal resources, and IID has granted mineral rights to various geothermal companies that would allow them to develop geothermal facilities in this area (subject to the appropriate environmental compliance and approval processes) (personal communication, B. Wilcox 2010). Future geothermal power plants may be located in areas that are currently submerged by the Salton Sea. Future facilities on land owned by IID could include one 10-acre well pad in each quarter section in unspecified locations within the Project's boundaries, pipelines to convey geothermal water, roads that can support heavy loads, and electric transmission lines. Pipelines, roads, and electric transmission lines may require easements up to 600 feet wide for construction, access, and maintenance. Geothermal power generation plants typically require sites up to 50 acres. At this time, it is not known whether such facilities would be constructed and where they would be located. Their siting, construction, and operation would require permits and independent environmental analysis.

Environmental Management

IID manages several experimental air quality management plots near the New River. Operation of these plots involves flooding part of the exposed playa. IID plans to construct more air quality management plots in the future, although IID indicated ample land is available around the Salton Sea and does not have to be in the immediate Project area (personal communication, B. Wilcox 2010).

The USFWS has indicated interest in developing approximately 700 acres of shallow water habitat in Red Hill Bay in an effort to maintain recent historic wetland values on this part of the NWR. This site was originally considered as a location for the SCH Project, but this area was removed from the SCH Project

alternatives based on the USFWS' plans for the area. This project would be adjacent to, but outside the area where the proposed SCH ponds at the Alamo River would be located. The USFWS is also planning to develop a restoration project at Bruchard Bay. This area is adjacent to, but outside of, the area proposed for the SCH Project. The Unit 1 A/B Ponds Reclamation Project is planned for a separate portion of the NWR at the southern tip of the Salton Sea. This area is within the current footprint of the proposed SCH alternatives at the New River. The SCH agencies would coordinate with the USFWS to maximize the constructability of both projects; however, the USFWS considers the SCH Project a priority in this area and if reclamation of part or all of the old Unit 1 A/B Ponds is not possible, the USFWS prefers to seek reclamation alternatives elsewhere (personal communication, C. Schoneman 2011).

3.13.4 Impacts and Mitigation Measures

3.13.4.1 Impact Analysis Methodology

The analysis considered the impacts of the SCH Project when evaluating whether the Project would conflict with any applicable plans, policies, or regulations or with any existing or planned land uses.

3.13.4.2 Thresholds of Significance

Significance Criteria

Impacts on land use would be significant if the SCH Project would:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental impact.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.
- Conflict with existing or planned land uses.

Application of Significance Criteria

A summary of the overall methodology used in applying the significance criteria to the Project alternatives follows:

- **Physically divide an established community –** SCH facilities would be located either within the seabed, along the shoreline downgradient from existing communities, or in agricultural areas. The brackish water pipeline that would be required to convey water from the New and/or Alamo rivers under Alternatives 1 and 4 would be buried and would not divide agricultural fields once construction was completed and the area restored. Therefore, the alternatives would not divide communities, and this criterion is not considered further.

- **Conflict with land use plans –** The analysis addresses conflicts with the Imperial County General Plan and other land use plans.

- **Conflict with an applicable habitat conservation plan or natural community conservation plan –** The IID Water Conservation and Transfer Project Habitat Conservation Plan applies to the Project area. The Project's relationship to this plan and potential conflicts are discussed further in Section 3.4, Biological Resources; therefore, this criterion is not considered further in this section.

- **Conflict with existing or planned land uses –** The potential for conflicts with existing and planned land uses is discussed below.

3.13.4.3 No Action Alternative

As described in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources and DFG 2007), the No Action Alternative would involve construction and maintenance activities for desert pupfish habitat channels. Additionally, the IID, as mitigation for the IID Water Conservation and Transfer Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at the Salton Sea State Recreation Area, as well as boat launches along the shoreline. Construction would be located within the current seabed.

Salinity in the Salton Sea is currently higher than 40,000 milligrams per liter and would continue to be higher in the No Action Alternative, and would not provide compliance with the Imperial County General Plan to support a wide range of marine fish and wildlife habitat or recreational uses.

By 2078, the Salton Sea's water surface elevation would decline to -248 feet mean sea level under the No Action Alternative. The reduction in water surface elevation would allow for development of a portion of the currently inundated lands in accordance with the Torres Martinez Land Use, Zoning and Development Plan. However, all of the tribal lands in the seabed would not be exposed.

If no action is taken, declining inflows in future years from various factors will result in collapse of the Salton Sea ecosystem due to increasing salinity and other water quality issues, such as temperature, eutrophication and related anoxia, and algal productivity. Taking no action would conflict with the Imperial County General Plan, which contains goals and objectives related to the natural resources associated with the Salton Sea, including maintenance of salinity levels and preservation of habitat that supports native and migrating birds. In addition to the General Plan, the No Action Alternative would conflict with other Federal, state, and regional land use plans and policies aimed at the restoration of the Salton Sea, including the Federal Salton Sea Restoration Act of 1998, SB 277, SB 317, SB 654, SB 1214, and the Salton Sea Revitalization & Restoration: Salton Sea Authority Plan for Multi-Purpose Project.

Declining water levels will also expose Salton Sea shoreline areas as playa; this exposed land area will become available for potential future economic development. This land would likely be designated for specific land uses by the appropriate land use agency, such as Imperial County, for residential, commercial, industrial, or open space development. Extensive geothermal resources exist in the vicinity of the New and Alamo rivers. These areas are planned for geothermal production and are expected to be developed with pads to locate drilling and well facilities. Additionally, IID plans to construct experimental air quality management plots in the Project vicinity. The No Action Alternative would not restore habitat along the existing shoreline or convert exposed playa to open water, and would not, therefore, have the potential to conflict with future planned land uses for the exposed playa areas.

3.13.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact LU-1: Given the implementation of mitigation measures identified in other sections of this EIS/EIR, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans or policies (less-than-significant impact). The SCH Project would be compatible with the Federal, state, and regional plans described under Section 3.3.2, Regulatory Setting, because it would restore habitat for fish and wildlife dependent on the Salton Sea and would reduce air emissions from what would otherwise become exposed playa. The Imperial County General Plan contains a number of goals and objectives that are applicable to the SCH Project, and the Project's consistency with each is discussed in Table 3.13-2. The discussion is applicable to all Project alternatives. For

purposes of this analysis, it is assumed that mitigation measures included in other resource sections would be implemented and, therefore, any conflicts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Table 3.13-2 Project Consistency with Applicable County of Imperial General Plan Goals and Objectives

Goal/Objective	Summary of Policy	Alternative 1-Alternative 6
	Land Use Element	
Objective 1.2	Discourage the location of incompatible development adjacent to or within productive agricultural lands.	The SCH Project would restore habitat in an area that currently supports and historically supported many birds and would not be incompatible with surrounding agricultural uses.
Goal 3	Achieve balanced economic and residential growth while preserving the unique natural, scenic, and agricultural resources of Imperial County.	The SCH Project would not conflict with any planned economic or residential growth and would restore the county's unique natural resources.
Objective 3.10	Identify and pursue funding sources for cleanup of the New and Alamo rivers and the Salton Sea.	The SCH Project would provide funding for the restoration of portions of the Salton Sea; funding for cleanup of the rivers is not part of the Project.
Objective 6.3	Protect industrial zoned areas from incompatible adjacent land uses and from under-utilization by non-industrial uses.	The New River sites are not located in an area zoned for industrial uses. The Alamo River brackish water pipeline and sedimentation basins could be located in an industrial zone, but would not be incompatible with industrial uses.
Goal 9	Identify and preserve significant natural, cultural, and community character resources and the county's air and water quality.	The Project would restore habitat to protect the county's natural resources and would also improve air quality by covering otherwise exposed playa, which could cause dust emissions, with open water ponds.
Objective 9.1	Preserve as open space those lands containing watersheds, aquifer recharge areas, floodplains, important natural resources, sensitive vegetation, wildlife habitats, historic and prehistoric sites, or lands that are subject to seismic hazards and establish compatible minimum lot sizes.	The Project would preserve a portion of the Salton Sea shoreline areas as natural habitat areas to support birds that are dependent on the Salton Sea.
Objective 9.5	Establish policies and programs for maintaining salinity levels in the Salton Sea that enable it to remain a viable fish and wildlife habitat.	The Project would result in a slight increase in salinity, but this increase would not be the cause of the decline of the Salton Sea ecosystem. Rather, the purpose of the Project is to restore habitat that would be lost due to increasing salinity levels.

Table 3.13-2 Project Consistency with Applicable County of Imperial General Plan Goals and Objectives

Goal/Objective	Summary of Policy	Alternative 1-Alternative 6
	Circulation & Scenic Highways Element	
Objective 1.12	Review new development proposals to ensure that the proposed development provides adequate parking and would not increase traffic on existing roadways and intersection to a level of service (LOS) worse than "C" without providing appropriate mitigations to existing infrastructure. This provision can include fair share contributions on the part of developers to mitigate traffic impacts caused by such proposed developments.	The Project would cause minimal temporary disruption to infrequently traveled county roads and would not reduce the level of service below LOS C.
Objective 1.17	Assure that road systems are adequate to accommodate emergency situations and evacuation plans.	The Project would not impede emergency access or evacuation plans.
Objective 3.8	Attempt to reduce motor vehicle air pollution. Require all major projects to perform an air quality analysis to determine the amount of pollution, as well as the alternative reduction options.	An air quality analysis was performed, and the results have been included in Section 3.3, Air Quality, along with mitigation measures that would reduce impacts to the extent feasible.
Objective 4.3	Protect areas of outstanding scenic beauty along any scenic highways and protect the aesthetics of those areas.	No scenic highways are within the Project vicinity. The Project would enhance the aesthetic qualities of the Salton Sea's southern shoreline by restoring exposed playa to open water ponds.
	Water Element	
Goal 2	Long-term viability of the Salton Sea, Colorado River, and other surface waters in the county will be protected for sustaining wildlife and a broad range of ecological communities.	The Project would restore habitat to enhance the Salton Sea's long-term viability as habitat for birds.
Objective 2.1	The continued viability of the agricultural sector as an important source of surface water for the maintenance of valuable wildlife and recreational resources in the county.	The Project would not affect the viability of agricultural lands as a source of surface water.
	Conservation and Open Space Element	
Goal 1	Environmental resources will be conserved for future generations by minimizing environmental impacts in all land use decisions.	The analysis and mitigation measures contained in this EIS/EIR are intended to minimize environmental impacts from Project implementation.
Objective 1.2	Encourage only those uses and activities that are compatible with the fragile desert, aquatic, and marshland environment.	The Project would restore sensitive aquatic resources and all allowed uses would be compatible with the restored environment.
Objective 1.5	Provide for the most beneficial use of land based upon recognition of natural constraints.	The Project would not preclude geothermal development and would be a beneficial use of land.
Goal 2	The County will preserve the integrity, function, productivity, and long-term viability of environmentally sensitive habitats, and plant and animal species.	The Project would restore a portion of the habitat being lost for fish and wildlife dependent on the Salton Sea and serve as a proof of concept for future development.

Table 3.13-2 Project Consistency with Applicable County of Imperial General Plan Goals and Objectives

Goal/Objective	Summary of Policy	Alternative 1-Alternative 6
Objective 2.1	Conserve wetlands, freshwater marshes, and riparian vegetation.	Project construction would result in temporary disturbance of Federal Waters of the U.S. and would have only minimal effects on wetlands.
Objective 2.2	Protect significant fish, wildlife, plant species, and their habitats.	The Project would restore aquatic habitat to enhance the long-term viability of the Salton Sea area as habitat for birds that are dependent on the Salton Sea.
Goal 7	The aesthetic character of the region will be protected and enhanced to provide a pleasing environment for residential, commercial, recreational, and tourist activity.	The Project would enhance the aesthetic qualities of the Salton Sea's southern shoreline by creating open water ponds on otherwise exposed playa.
Goal 8	The County will conserve, protect, and enhance the water resources in the planning area.	The Project would restore habitat to enhance the long-term viability of the Salton Sea as habitat for birds that are dependent on the Sea.
Objective 8.1	Protect all bodies of water, e.g., Salton Sea, and water courses for their continued use and development.	The Project would restore habitat to enhance the long-term viability of the Salton Sea as habitat for birds that are dependent on the Sea.
Objective 8.2	Maintain the salinity of the Salton Sea at 40,000 parts per million salinity and encourage the advantageous usage of the Salton Sea for agricultural and natural drainage, recreation, and development.	The salinity of the Salton Sea already exceeds this target. The Project would slightly increase the Salton Sea's salinity, but would not affect the use of the Sea for drainage or development. It would provide recreational opportunities to the extent that they are consistent with the management objectives.
Objective 8.3	Regulate development in or adjacent to water bodies and courses, protect water bodies and minimize property damage. Zone the areas around the Salton Sea below elevation -220 feet as open space to minimize property damage from fluctuating sea elevations.	The Project area, which is below -220 feet, would be maintained as open space.

Table 3.13-2 Project Consistency with Applicable County of Imperial General Plan Goals and Objectives

Goal/Objective	Summary of Policy	Alternative 1-Alternative 6
Objective 8.5	Protect and improve water quality and quantity for all water bodies in Imperial County.	Construction would result water quality impacts at the Salton Sea. Generally, these potential impacts would be short-term and limited to the duration of construction. The Project would include an Erosion and Sediment Control Plan and a Stormwater Pollution and Prevention Plan for construction and maintenance activities. These plans would address the potential for erosion and incorporate appropriate protections into the design. Pesticide residues are present in the sediments at the pond sites. Although DDT residues could remain in the surface sediments beyond the 2-year construction period, concentrations would likely be similar to elevated concentrations already present in several other nearby habitats. Project operations would cause changes in Salton Sea water quality but would not violate established standards. The Project would result in a minor increase in the salinity and decrease in the elevation of the Salton Sea, but the Sea will get smaller, shallower, and saltier regardless of whether the SCH Project is implemented or not.
Objective 8.8	Ensure protection of water bodies that are important for recreational fishing.	The Project would not limit recreational fishing opportunities at the Salton Sea or other areas and may provide opportunities for anglers.
	Seismic & Public Safety Element	
Goal 2	Minimize potential hazards to public health, safety, and welfare and prevent the loss of life and damage to health and property resulting from both natural and human-related phenomena.	Section 3.10, Hazards and Hazardous Materials, includes mitigation measures that would reduce potential hazards to public health and safety to less-than-significant levels.
Objective 2.3	Identify potential risk and damage due to inundation from dam failure and/or water releases.	The Project would not result in significant risks from dam failure or water releases, including those resulting from berm failure.
	Geothermal & Transmission Element	
Goal 1	The County of Imperial supports and encourages the full, orderly, and efficient development of geothermal/alternative energy resources while at the same time preserving and enhancing where possible agricultural, biological, human, and recreational resources.	The Project would restore and protect biological resources and would not preclude future development of geothermal energy.
Objective 1.1	Design for the co-location of energy facilities through the designation of “energy park” zones to increase certainty and facilitate power generation development and to provide for efficient use of land resources.	The Project would not preclude geothermal facilities, thus allowing for the co-location of energy facilities and restored bird habitat.

Impact LU-2: Restoration of habitat for birds that are dependent on the Salton Sea would not result in substantive conflicts with existing adjacent land uses (less-than-significant impact). Land uses adjacent to or within the Project footprint at the New River include agricultural fields and portions of the NWR. The Project would be consistent with the NWR's objectives, which include preserving natural resource areas to provide a refuge and breeding ground for birds and other wildlife; DFG and the USFWS would continue to coordinate throughout operations to manage any potential conflicts.

The Project would be located in an area that historically has been used by large numbers of birds and would restore a portion of the habitat that is being lost as the salinity of the Salton Sea increases and as the Sea recedes. Birds can cause a loss of leafy green crops through depredation and by exposing those crops to fecal matter, which may require the destruction of the affected portion of the field. As discussed in Section 3.19, Socioeconomics, however, the Project would not result in a substantial difference in impacts on agricultural uses than those occurring at present. Over time, fewer birds will be present at the Salton Sea as a whole, reducing the overall potential for impacts on nearby agricultural lands. Therefore, impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses (less-than-significant impact). Future planned land uses in the general area include geothermal development, experimental air quality management plots, and NWR habitat restoration projects. While the KGRA is largely west of the New River, it is conservatively assumed that geothermal development could occur at all of the proposed pond sites. Geothermal development companies were consulted while the SCH Project alternatives were being developed, and the Project is based on information that is currently available regarding their requirements, and how the ponds and berms could be adapted, as needed, to accommodate future geothermal facilities such as well pads and access roads. Although this accommodation could incrementally reduce the amount of habitat restored as part of the SCH Project, this loss would not affect the overall viability of the Project and the benefits it provides. Modifications to the SCH Project to accommodate this future development would be the responsibility of the geothermal developers and the impacts of such development are outside the scope of this EIS/EIR.

IID also has a requirement to develop air quality management plots near the Salton Sea, but as noted above, IID has indicated that they have sufficient land elsewhere, and the SCH Project would not conflict with this requirement (personal communication, B. Wilcox 2010).

The SCH Project would be fully compatible with planned restoration projects near the New River. It would be outside the boundaries of the Bruchard Bay project, and would not conflict with its construction or operation. The SCH agencies would coordinate with the USFWS to maximize the constructability of the SCH Project and the Unit 1 A/B Ponds; however, the USFWS considers the SCH Project a priority in this area and if reclamation of part or all of the old Unit 1 A/B Ponds is not possible as a result of the SCH Project, the USFWS prefers to seek reclamation alternatives elsewhere (personal communication, C. Schoneman 2011).

Any conflicts with future planned land uses would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

3.13.4.5 Alternative 2 – New River, Pumped Diversion

Impact LU-1: Given the implementation of mitigation measures identified in other sections of this EIS/EIR, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans or policies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact LU-2: Restoration of habitat for birds that are dependent on the Salton Sea would not result in substantive conflicts with existing adjacent land uses (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.13.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact LU-1: Given the implementation of mitigation measures identified in other sections of this EIS/EIR, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans or policies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact LU-2: Restoration of habitat for birds that are dependent on the Salton Sea would not result in substantive conflicts with existing adjacent land uses (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.13.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact LU-1: Given the implementation of mitigation measures identified in other sections of this EIS/EIR, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans or policies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact LU-2: Restoration of habitat for birds that are dependent on the Salton Sea would not result in substantive conflicts with existing adjacent land uses (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative. The Alternative 4 ponds would be located near the mouth of the Alamo River within or adjacent to Sonny Bono NWR, agricultural fields, geothermal production plants, and Red Hill Park. Impacts on the NWR and agricultural fields would be similar to those discussed above, and the Project would not conflict with existing geothermal development. Once the Project was constructed, Red Hill Park would benefit from the Project because both the recreational and aesthetic value of the surrounding area would be enhanced. Construction would result in short-term disruptions to those staying at the park from noise and visual degradation and night lighting (refer to Sections 3.1, Aesthetics and 3.14, Noise), but these impacts would be temporary and would not result in a permanent land use conflict. Moreover, mitigation measures included in other sections of this EIS/EIR would minimize the potential for land use conflicts. Impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative.

Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses (less-than-significant impact). Future planned land uses in the general area include geothermal development (this site is in a KGRA) experimental air quality management plots, and development of shallow water habitat at Red Hill Bay by USFWS. The discussion under Alternative 1 related to geothermal development and the experimental air quality management plots is applicable to this alternative. The SCH Project would be fully compatible with the development of habitat at Red Hill Bay because both projects would restore habitat for birds that use the Salton Sea.

3.13.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact LU-1: Given the implementation of mitigation measures identified in other sections of this EIS/EIR, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans or policies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact LU-2: Restoration of habitat for birds that are dependent on the Salton Sea would not result in substantive conflicts with existing adjacent land uses (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

3.13.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact LU-1: Given the implementation of mitigation measures identified in other sections of this EIS/EIR, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans or policies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact LU-2: Restoration of habitat for birds that are dependent on the Salton Sea would not result in substantive conflicts with existing adjacent land uses (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

Impact LU-3: The Project would be designed to minimize conflicts with future planned land uses (less-than-significant impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

3.13.5 References

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3.13.6 Personal Communications

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3.14 NOISE

3.14.1 Introduction

This section focuses on noise impacts on human noise-sensitive receptors from construction, operations, and maintenance. Noise impacts on wildlife are addressed in Section 3.4, Biological Resources. The study area includes the alternative site locations and immediate surrounding areas, as well as the areas surrounding the access roads that would be used by equipment, personal vehicles, and heavy trucks, including State Routes (SR) 78, 86, and 111.

Table 3.14-1 summarizes the impacts of the six Species Conservation Habitat (SCH) Project alternatives on noise, compared to both the existing conditions and the No Action Alternative.

Table 3.14-1 Summary of Noise Impacts

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact NOI-1: Daytime construction and maintenance activities would cause a temporary increase in noise levels near the Project sites.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact NOI-2: Dredging could extend beyond the hours typically allowed by Imperial County.	Existing Condition	L	L	L	S	S	S	MM NOI-1: Avoid nighttime construction near Red Hill Park.
	No Action	L	L	L	S	S	S	Same as Existing Condition
Impact NOI-3: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact NOI-4: Noise from installation of the seawater pipeline and associated pump could exceed Imperial County's construction thresholds.	Existing Condition	O	O	O	S	S	O	MM NOI-2. Control noise from installation of the seawater pump and pipeline.
	No Action	O	O	O	S	S	O	Same as Existing Condition
Impact NOI-5: Noise from operation of the seawater pump could exceed Imperial County's thresholds at Red Hill Park.	Existing Condition	O	O	O	S	O	O	MM NOI-3: Control operational noise from the seawater pump.
	No Action	O	O	O	S	O	O	Same as Existing Condition

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

The following background information on noise is taken from the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources [DWR] and California Department of Fish and Game [DFG] 2007).

Noise is defined as unwanted sound. Noise usually is objectionable because it is disturbing or annoying due to its pitch or loudness. Pitch is frequency of a tone or sound. The human ear does not hear all frequencies equally. In particular, the ear deemphasizes low and very high frequencies. Loudness is intensity of sound waves combined with the ear's reception characteristics.

A decibel (dB) is a unit of measurement that is used to indicate the relative amplitude of a sound. Sound levels in dB are calculated on a logarithmic scale. Subjectively, each 10-dB increase in sound level is generally perceived as a doubling of loudness. Human ears do not respond consistently across a frequency range that can be heard. To more accurately represent the response of a human ear, sound meters include filters. Most sound measurements are conducted using a sound filter referred to as the "A scale." Therefore, the measurements are reported as "dBA."

Because sound levels can vary over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time varying events. This energy equivalent sound/noise descriptor is called equivalent noise level (Leq). The most common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration. Table 3.14-2 shows typical A-weighted noise levels measured in the environment.

Table 3.14-2 Typical Sound Levels Measured in the Environment and Industry

Sound Level (dBA)	Potential Source or Human Perception of Sound
130 - 140	Pain threshold
120	Jet takeoff (200 feet)
110	Chainsaw (2 feet) or amplified music concert
100	Pile driver (50 feet)
90	Power mower or heavy truck (50 feet)
60	Hearing damage can occur at exposures of 8 hours
50	Air conditioner unit
40	Requires loud speech at 3 feet
0	Light auto traffic (100 feet) or quiet office
Source: County of Imperial 1997	

Because sensitivity to noise increases during the evening and at night when excessive noise interferes with the ability to sleep, 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level (CNEL) is a measure of the cumulative noise exposure in a community with an about 5-dBA penalty added to evening (7:00 pm to 10:00 pm) and a 10-dBA addition to nocturnal (10:00 pm to 7:00 am) noise levels. The day/night

average sound level (Ldn) is essentially the same as CNEL, without applying any penalty to noise events occurring in the evening time period.

Noise changes both in level and frequency spectrums as it travels from the source to the receiver. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise is reduced depends on a variety of factors, including the noise source type as well as the region over which the noise source propagates. Noise generated by a point source, such as equipment at a construction site, drops off at a rate of 6 dBA per doubling of distance. Traffic noise attenuates, or is reduced, at a different rate. The movement of vehicles makes the noise source appear to emanate from a line as opposed to a single point when viewed over a period of time. Noise levels drop off at a rate of about 3 dBA per doubling of distance for this type of source near hard surfaces, such as paved areas or bodies of water. However, ground type also plays into how much of a drop off over distance will occur. Surfaces, such as plowed fields, crops, or grass, absorb some of the sound energy as the sound passes over; therefore, noise is reduced by 4.5 dBA for every doubling of the distance in such areas.

3.14.2 Regulatory Requirements

Noise is typically regulated at the local level, and no Federal or state noise regulations are applicable to the SCH Project. The Noise Element of the Imperial County General Plan (County of Imperial 1997) is intended to ensure that land uses are compatible with the ambient noise levels, and outlines acceptable noise levels for various land uses during construction and operations. The Imperial County Noise Abatement and Control Ordinance also establishes 1-hour average sound level limits at residential, commercial, manufacturing and agricultural, and general industrial areas. Relevant standards from both documents are discussed below by type of standard (e.g., for construction noise or operation noise) (DWR and DFG 2007).

Construction Noise

The Noise Element limits sound levels from construction activities during specific hours of the day and night through a set of construction noise standards, presented in Table 3.14-3 (County of Imperial 1997). The standards apply to the noise measured at the nearest sensitive receptor. The Noise Element defines sensitive receptors as areas of habitation where the intrusion of noise has the potential to adversely affect the occupancy, use, or enjoyment of the environment. Sensitive receptors include, but are not limited to, residences, schools, hospitals, parks, and office buildings. Imperial County does not have construction standards for vibration (DWR and DFG 2007).

Table 3.14-3 County of Imperial Construction Noise Standards

Duration of Construction	Noise Source	Sound Level (dBA L_{eq})[a]	Period of Averaging (hours)	Restricted Hours of Operation
Short term (days or weeks)	Single piece of construction equipment	75	8	7 am to 7 pm Monday-Friday 9 am to 5 pm Saturday No commercial construction operation is permitted on Sundays and holidays.
Short term (days or weeks)	Combination of pieces of construction equipment	75	8	7 am to 7 pm Monday-Friday 9 am to 5 pm Saturday No commercial construction operation is permitted on Sundays and holidays.

Table 3.14-3 County of Imperial Construction Noise Standards

Duration of Construction	Noise Source	Sound Level (dBA L_{eq})[a]	Period of Averaging (hours)	Restricted Hours of Operation
Extended term[b]	Single piece of construction equipment	75	1	7 am to 7 pm Monday-Friday 9 am to 5 pm Saturday No commercial construction operation is permitted on Sundays and holidays.
Extended term[b]	Combination of pieces of construction equipment	75	1	7 am to 7 pm Monday-Friday 9 am to 5 pm Saturday No commercial construction operation is permitted on Sundays and holidays.

Source: County of Imperial 1997

[a] As measured at the nearest sensitive receptor.

[b] The standards assume a construction period, relative to an individual sensitive receptor, of days or weeks. The standard can be made more restrictive in cases of extended-length construction times.

Operation Noise

Imperial County's noise and land use compatibility guidelines identified in the Noise Element (County of Imperial 1997) that are applicable to the study area are shown in Table 3.14-4. The Noise Element also includes Property Line Noise Limits that apply to noise generation from one property to an adjacent property; those applicable to the study area are listed in Table 3.14-5. The standards imply the existence of a sensitive receptor on the adjacent, or receiving, property. In the absence of a sensitive receptor, an exception or variance to the standards may be appropriate. The Imperial County Noise Abatement and Control Ordinance also includes property line noise limits that are consistent with those listed below.

The Noise Element also defines a Noise Impact Zone as an area that is likely to be exposed to significant noise. Imperial County defines a Noise Impact Zone as an area that may be exposed to noise greater than 60 dBA CNEL or 75 dBA Leq (averaged over 1 hour). Any property within ¼ mile (1,320 feet) of existing farmland that is in an agricultural zone is within a Noise Impact Zone (DWR and DFG 2007).

Table 3.14-4 Imperial County Noise/Land Use Compatibility Guidelines

Land Use Category	Compatible Sound Levels with Land Use Categories			
	55 dBA	60 dBA	70 dBA	80 dBA
Residential	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Normally Acceptable	Normally Unacceptable		Clearly Unacceptable
Industrial, Manufacturing Utilities, Agriculture	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable

Source: County of Imperial 1997

Normally Acceptable: Specified land use is satisfactory without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements.

Normally Unacceptable: New construction or development should be discouraged.

Clearly Unacceptable: New construction or development clearly should not be undertaken.

Table 3.14-5 County of Imperial Operation Noise Standards

Land Use Zone	Time	Applicable Limit 1-hour Average Sound Level (dBA)
Residential Zones	7 am to 10 pm	50
	10 pm to 7 am	45
General Industrial Zones (including agricultural operations)	Anytime	75

Source: County of Imperial 1997

Note: When the noise-generating property and the receiving property have different uses, the more restrictive standard shall apply. When the ambient noise level is equal to or exceeds the Property Line noise standard, the increase of the existing or proposed noise shall not exceed 3 dBA Leq.

3.14.3 Affected Environment

Noise within the study area is generated by a variety of sources, including vehicular traffic, aircraft, and agricultural activities; wind also is a noise source. Noise from vehicular traffic is concentrated near the major roadways. Aircraft noise is intermittent and includes occasional military overflights and crop dusters. Agricultural operations generate noise through field machinery, especially when it is diesel driven, and through the use of trucks to transport supplies and crops. Noise in rural areas can be quiet (around 40 to 45 dBA), although as noted above, agricultural operations can generate considerable noise.

The noise-sensitive receptors closest to the construction sites are the long-term residents and campers at Red Hill Park, near the Alamo River sites, and those using the Sonny Bono Salton Sea National Wildlife Refuge (Sonny Bono NWR) for activities where relative quiet is a part of the experience, such as wildlife observation and photography and use of nature trails. The closest areas of the refuge where such activities occur are an observation platform, photography blind, and the associated Hardenberger Trail at the end of Vendel Road, over ½ mile south of the proposed West New site near the New River.

3.14.4 Impacts and Mitigation Measures

3.14.4.1 Impact Analysis Methodology

Noise generated during construction was based on United States (U.S.) Environmental Protection Agency (1971) calculations for public works projects by reviewing the number of truck trips that would be generated in relationship to existing traffic levels. Noise levels to the nearest sensitive receptors were calculated using standard factors. The significance of construction and maintenance activities was considered in relation to Imperial County's standards for construction noise, while the potential for long-term impacts was based on normally acceptable levels identified in the Noise Element of the General Plan (County of Imperial 1997) and the following guidance from the Noise Element:

- If the future noise levels from the action are within the normally acceptable noise level guidelines, but result in an increase of 5 dBA CNEL or greater, the action would have a potentially significant noise impact, and mitigation measures must be considered.
- If the future noise level after the action is completed is greater than the normally acceptable noise level, a noise increase of 3 dBA CNEL or greater should be considered a potentially significant noise impact and mitigation measures must be considered.

The Noise Element does not specifically identify noise compatibility guidelines for campgrounds and recreational vehicle parks; therefore, guidelines for residential uses are considered applicable at Red Hill Park.

3.14.4.2 Thresholds of Significance

Significance Criteria

Impacts on noise would be significant if the SCH Project would:

- Expose people to or generate noise levels in excess of standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies; or temporary or periodic increase in ambient noise levels in the vicinity above existing levels;
- Expose people to or generate excessive ground-borne vibration or noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project areas to excessive noise levels.

Application of Significance Criteria

- **Expose people to or generate noise levels in excess of established standards or temporary or periodic increase in ambient noise levels –** The potential for Project construction, operations, and maintenance activities to exceed Imperial County's noise standards is considered.
- **Expose people to or generate excessive ground-borne vibration or noise levels –**Trucks and other types of construction equipment would generate some vibration, but vibration attenuates rapidly (approximately 50 percent for each doubling of distance from the source) and perceptible vibration

could be experienced only within 50 feet of trucks traveling over uneven surfaces or other ground disturbance. Construction and maintenance activities would occur in a remote, rural area and would not expose people to excessive ground-borne vibration or noise. This criterion is not discussed further.

- **Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project –** Noise impacts from pumps are discussed below.
- **For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels –** The Project sites are not located in such an area, and people working on the Project would not be exposed to excessive noise levels. This criterion is not discussed further.
- **For a project within the vicinity of a private airstrip, expose people residing or working in the project areas to excessive noise levels–** The Project sites are not located in such an area, and people working on the Project would not be exposed to excessive noise levels. This criterion is not discussed further.

3.14.4.3 No Action Alternative

The description of the impacts of the No Action Alternative that is included in the Programmatic Environmental Impact Report (DWR and DFG 2007) is applicable to the SCH Project and summarized below. The No Action Alternative would involve construction and operations and maintenance activities associated with pupfish channels and relocating recreational facilities as the Salton Sea recedes. The ambient noise levels in the future would be dependent upon factors such as population growth, land use changes, and changes to the amount of vehicular, air, and rail traffic. In general, noise is expected to increase as the population and traffic increases. Full buildout of communities under the current general and area plans would result in some residential development that would be exposed to increasing noise. Construction activities could adversely affect noise receptors at nearby communities, but impacts would be temporary and likely to be brief.

3.14.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Noise would be generated by trucks and equipment used during construction and maintenance activities. The level of noise from construction and maintenance activities would depend on several factors, including the following:

- The phase of construction;
- The type of equipment used and its location on the construction site;
- The amount of time that a given piece of equipment would operate at its loudest mode; and
- The proximity of noise-sensitive receptors to construction activities.

Not all equipment would be used for all phases of construction and maintenance, and not all would operate at peak capacity concurrently. Table 3.14-6 shows the types of trucks and equipment that would be used during construction and maintenance, along with the estimated quantity, days of use, and hours of use. The U.S. Environmental Protection Agency (1971) estimated that construction of public works projects, which include features similar to those of the SCH Project, typically generates an average of between 78 and 88 dBA depending on the construction phase and the amount of equipment being used. Assuming construction noise of 78 to 88 dBA, noise attenuation from construction activities is anticipated to occur as shown in Table 3.14-7.

It is assumed that commuters, haul trucks, and tractor trailers would likely approach the Project site by traveling along SR-86 or SR-111, both of which run primarily in a north-south direction and connect Imperial County's primary population centers. Tractor trailers hauling riprap material to the Project site likely would originate on the Salton Sea's northwestern side. They would travel south on SR-86, exiting at West Bannister Road where they would travel east for approximately 2 miles before heading north on Bruchard Road for about 4 miles.

Table 3.14-6 Alternative 1 – Estimated Equipment Use During Construction and Maintenance

	Habitat Construction			Annual Maintenance		
Equipment Type	Quantity	Hours/Day	Total Days*	Quantity	Hours/Day	Days/Year
On-Highway Tractor Trailer	50	8	2,495	1	8	37
Tractor Scraper	3	8	974	1	8	28
Dump Truck	12	8	261	1	8	18
Excavator	3	8	1,126	1	8	35
Bulldozer	2	8	466	1	8	5
Grader	1	8	25	1	8	25
Clamshell Derrick Rig	3	20	796	—	—	—
Hydraulic Dredge	1	8	91	—	—	—
Crane Rig	1	8	20	—	—	—
Backhoe	1	8	200	1	8	24
Tractor	—	—	—	1	8	3

* Total Days is the product of the quantity of equipment multiplied by the days each piece of equipment would be operating during construction.

Table 3.14-7 Attenuation of a Noise Source of 78 to 88 dBA

Distance (feet)	Noise Level (dBA)
50	78 - 88
100	72 - 82
200	66 - 76
400	60 - 70
800	54 - 64
1,600	48 - 58
3,200	42 - 52
6,400	36 - 46
12,800	30 - 40

Note: this attenuation is applicable to point sources, such as construction equipment, not mobile sources, such as truck traffic.

Workers would also likely approach the Project site near the New River by SR-86. Project vehicles coming from the north and traveling southbound along SR-86 would follow the same route as tractor trailers, exiting at West Bannister Road, traveling east, and then turning north on Bruchard Road. Vehicles traveling northbound on SR-86 would likely exit the highway at Lack Road, traveling north, turning west on West Bannister Road, and then turning north on Bruchard Road until reaching the Project site.

The primary source of noise during operations would be the pump required to deliver water from the Salton Sea to the ponds and the tailwater return pump. The pumps would be electric and would generate between 30 and 60 dBA. No noise-sensitive receptors are within hearing distance of the pump sites, which would be located in the Sea under Alternative 1. The tailwater pump would be located approximately 1 mile from the nearest agricultural fields, and noise from the pump would not be perceptible at this location; thus, no impacts would occur.

Impact NOI-1: Daytime construction and maintenance activities would cause a temporary increase in noise levels near the Project sites (less-than-significant impact). The types of equipment that would be used and duration of use are shown in Table 3.14-6. The SCH pond sites and the area where the diversion facility, brackish water pipeline, and sedimentation basin would be located is bordered by agricultural land and mudflats, and no noise-sensitive receptors are present in the vicinity. The nearest sensitive receptors would be visitors to the Sonny Bono NWR. The closest part of the refuge that is accessible to the public is the observation platform, photography blind, and the associated Hardenberger Trail at the end of Vendel Road. This area is over ½ mile south of the West New pond unit. At this distance, noise from the nearest construction locations may be perceptible on days with little wind, but would be perceived as background noise and would be well under the 75-dBA construction threshold established by Imperial County (noise levels would be reduced to approximately 44 to 55 dBA at a distance of ½ mile). Annual maintenance would require less equipment and for fewer days than construction and, therefore, would generate less noise. Noise impacts from construction and operations would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact NOI-2: Dredging could extend beyond the hours typically allowed by Imperial County (less-than-significant impact). A diesel-powered clamshell dredge typically generates 85 dBA at 50 feet from the source (U.S. Army Corps of Engineers 2000, as cited in U.S. Army Corps of Engineers and Los Angeles Harbor Department 2008). Comparable noise levels are expected from the hydraulic dredge. Imperial County typically limits construction to 7 am to 7 pm on Monday-Friday and 9 am to 5 pm on Saturday, but a variance would be requested from Imperial County if the construction contractor determined that dredging would best be accomplished by dredging 24 hours a day in order to complete the work in a timelier manner. Given the lack of noise-sensitive receptors that are present near the New River during the night, the increased hours of equipment use would not result in an additional environmental impact, and any impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact NOI-3: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents (less-than-significant impact). Noise from trucks and tractor trailers is typically between 82 and 75 dBA at 50 feet from the roadway, depending on what types of noise controls are used. This level would diminish to approximately 78 to 71 dBA. Average noise levels would be less, however, because trucks and tractor trailers would not pass constantly. Most tractor trailer trips would be associated with hauling riprap. It is assumed that delivery of rock and gravel would produce a maximum of 150 tractor trailer round-trips per day (300 trips) for an approximately 2- to 3-month period. Delivery of equipment and materials like pipe to the Project site from more distant locations would require a maximum of 187 round-trips (374 trips) total over the 2-year construction period. As discussed in Section

3.20, Transportation and Traffic, the average daily traffic in the peak direction along the portion of SR-86 that would be most affected by truck traffic ranges from 10,800 to 13,800 trips. It takes a doubling of vehicular traffic to increase noise levels by 3 dBA; therefore, the addition of truck trips from the SCH Project would not cause a perceptible increase in noise along this portion of the route.

The only noise-sensitive receptors along the remainder of the route are residences at West Bannister Avenue and Vendel Road, and West Bannister Road and Pellet Road. Truck trips would take place within the hours allowed by Imperial County, and impacts from truck traffic would not exceed 75 dBA Leq and, thus, would not conflict with Imperial County's construction noise standards. Moreover, to the extent practicable, truck traffic would follow routes that would avoid residences. This impact would be less than significant when compared to both the existing environmental setting and the No Action Alternative. Only minor amounts of traffic would be generated by maintenance activities, and any impacts would be less than significant.

3.14.4.5 Alternative 2 – New River, Pumped Diversion

Impact NOI-1: Daytime construction and maintenance activities would cause a temporary increase in noise levels near the Project sites (less-than-significant impact). Table 3.14-8 shows the types of trucks and equipment that would be used during construction and maintenance. Alternative 2 would require the use of a pump instead of a water pipeline to provide brackish water to the ponds, but it would not be located in proximity to noise-sensitive receptors, and resulting noise would be well under the thresholds for agricultural areas. The discussion under Alternative 1 is applicable to this alternative.

Table 3.14-8 Alternative 2 – Estimated Equipment Use During Construction and Maintenance

	Habitat Construction			Annual Maintenance		
Equipment Type	Quantity	Hours/Day	Total Days*	Quantity	Hours/Day	Days/Year
On-Highway Tractor Trailer	40	8	2,057	1	8	34
Tractor Scraper	3	8	792	1	8	27
Dump Truck	10	8	2,645	1	8	19
Excavator	3	8	874	1	8	38
Bulldozer	2	8	325	1	8	6
Grader	1	8	28	1	8	25
Clamshell Derrick Rig	2	20	537	—	—	—
Hydraulic Dredge	1	8	91	—	—	—
Crane Rig	1	8	21	—	—	—
Backhoe	1	8	200	1	8	11
Tractor	—	—	—	1	8	3

* Total Days is the product of the quantity of equipment multiplied by the days each piece of equipment would be operating during construction.

Impact NOI-2: Dredging could extend beyond the hours typically allowed by Imperial County (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact NOI-3: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.14.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact NOI-1: Construction and maintenance activities would cause a temporary increase in noise levels near the Project sites (less-than-significant impact). Table 3.14-9 shows the types of trucks and equipment that would be used during construction and maintenance. The discussion under Alternative 2 is applicable to this alternative.

Table 3.14-9 Alternative 3 – Estimated Equipment Use During Construction and Maintenance

	Habitat Construction			Annual Maintenance		
Equipment Type	Quantity	Hours/Day	Total Days*	Quantity	Hours/Day	Days/Year
On-Highway Tractor Trailer	60	8	2,937	1	8	45
Tractor Scraper	4	8	1,060	1	8	28
Dump Truck	14	8	3,733	1	8	19
Excavator	4	8	1,163	1	8	44
Bulldozer	3	8	438	1	8	6
Grader	1	8	34	1	8	25
Clamshell Derrick Rig	4	20	1,056	—	—	—
Hydraulic Dredge	1	8	91	—	—	—
Crane Rig	1	8	21	—	—	—
Backhoe	1	8	200	1	8	28
Tractor	—	—	—	1	8	3

* Total Days is the product of the quantity of equipment multiplied by the days each piece of equipment would be operating during construction.

Impact NOI-2: Dredging could extend beyond the hours typically allowed by Imperial County (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact NOI-3: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.14.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact NOI-1: Daytime construction and maintenance activities would cause a temporary increase in noise levels near the Project sites (significant impact). Table 3.14-10 shows the types of trucks and equipment that would be used during construction and maintenance. The discussion under Alternative 1 regarding noise construction levels, construction of the diversion facility, brackish water pipeline, sedimentation basin, and tailwater return pump is applicable to Alternative 4. Noise-sensitive receptors in the vicinity of the Alamo River ponds include residents and campers at Red Hill Park. These receptors would be approximately 800 feet from the nearest pond site, and noise from construction in this area would be reduced to between approximately 54 to 64 dBA at the park, which is under the 75 dBA threshold specified by Imperial County for construction activities. Noise levels at the park would be reduced as construction equipment moved farther away. Therefore, impacts from daytime pond construction would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Table 3.14-10 Alternative 4 – Estimated Equipment Use During Construction and Maintenance

	Habitat Construction			Annual Maintenance		
Equipment Type	Quantity	Hours/Day	Total Days*	Quantity	Hours/Day	Days/Year
On-Highway Tractor Trailer	20	8	1,017	1	8	20
Tractor Scraper	2	8	615	1	8	26
Dump Truck	7	8	1,821	1	8	18
Excavator	2	8	618	1	8	26
Bulldozer	2	8	311	1	8	5
Grader	1	8	14	1	8	25
Clamshell Derrick Rig	1	20	296	—	—	—
Hydraulic Dredge	1	8	91	—	—	—
Crane Rig	1	8	21	—	—	—
Backhoe	1	8	200	1	8	6
Tractor	—	—	—	1	8	3

* Total Days is the product of the quantity of equipment multiplied by the days each piece of equipment would be operating during construction.

Impact NOI-2: Dredging could extend beyond the hours typically allowed by Imperial County (significant impact). As discussed under Alternative 1, a potential exists for dredging to occur outside the hours typically required by Imperial County (7 am to 7 pm on weekdays and 9 am to 5 pm on Saturday). A variance would be requested from Imperial County if the construction contractor determined that dredging would best be accomplished by dredging 24 hours a day in order to complete the work in a timelier manner. Should this occur, nighttime noise levels at the camping/recreational vehicle sites at Red Hill Park could be elevated, depending on the location of the dredge. Dredging would be required at the outer berms, the closest of which is approximately 800 feet from Red Hill Park. Noise from dredging at this location would generate approximately 61 dBA at the park. This is under the 75 dBA threshold

established for construction activities, but this threshold is applicable only to daytime construction. The increased noise level would be substantially over the expected ambient level during the night and could cause sleep disturbance (the Noise Element of the Imperial General Plan indicates that sleep disturbance occurs at 50 dBA). The noise level also is well over the 45 dBA 1-hour Average Sound Level operational standard considered acceptable for residential uses between 10 pm and 7 am (Table 3.14-5). This impact would be significant when compared to both the existing environmental setting and No Action Alternative. Noise would be reduced to 45 dBA at about 4,800 feet from the park, at which point the noise would be reduced to a less-than-significant level.

Mitigation Measures

MM NOI-1: Avoid nighttime construction within 4,800 feet of Red Hill Park. Should construction occur when the park is occupied, dredging would not occur within 4,800 feet of the park unless it is within the hours specified by Imperial County.

Residual Impact

Implementation of MM NOI-1 would reduce this impact to less than significant because noise would be reduced to approximately 45 dBA, which is under the threshold allowable for residential uses.

Impact NOI-3: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents (less-than-significant impact). The discussion under Alternative 1 is applicable to Alternative 4. As discussed under Alternative 1, tractor trailers hauling riprap material to the Project site likely would originate on the Salton Sea's northwestern side. They would approach the site via SR-86/SR-78. They would exit the highway at Forrester Road (Highway 30), travel north, then continue north on Gentry Road. At West Sinclair Road, construction vehicles would turn east until reaching the Project area. Impacts along SR-86/SR-78 would be as described under Alternative 1; traffic volumes on these roads are comparatively high, and Project truck traffic would not result in perceptible difference. Truck traffic on the local roads is considerably less, as discussed in Section 3.20, Transportation and Traffic. On weekdays, average daily traffic along Forrester Road near Westmorland is about 440 vehicles, increasing to 875 vehicles near West Walker Road and Gentry Road. Noise-sensitive receptors include residents in Westmorland and an isolated residence near West Walker Road and Gentry Road. Particularly during the 2- to 3-month period when riprap would be hauled, average noise levels would increase, but would be under the 75-dBA threshold established by Imperial County. Impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact NOI-4: Noise from installation of the seawater pipeline and associated pump could exceed Imperial County's construction thresholds at Red Hill Park (significant impact). The seawater pipeline and pump station would be located approximately 200 feet from the camping/recreational vehicle sites at Red Hill Park. Depending on the construction techniques used, a potential exists for noise from installation to exceed Imperial County's construction noise thresholds at this location. Assuming construction noise ranging from 78 to 88 dBA, the resulting noise at a distance of 200 feet would be 66 to 76 dBA. Thus, construction could slightly exceed Imperial County's 75 dBA construction threshold, which would be a significant impact when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM NOI-2: Control noise from installation of the seawater pump and pipeline. The following measures will be implemented:

- Install manufacturer's standard noise control devices, such as mufflers, on construction equipment;

- Locate stationary equipment as far as possible from noise-sensitive receptors;
- Prior to construction, notify residents and post signs at the campground describing the types of construction activities that would occur and the expected duration;
- Keep idling of construction equipment to a minimum when not in use; and
- Install temporary or portable acoustic barriers around stationary construction noise sources.

Residual Impact

Implementation of MM NOI-2 would reduce construction and operations impacts to less than significant because noise levels would meet Imperial County's standards.

Impact NOI-5: Noise from operation of the seawater pump could exceed Imperial County's construction thresholds at Red Hill Park (significant impact). Depending on the type of pump that is selected, noise from its operation would range from 30 to 60 dBA. A pump that generated 30 dBA would result in noise that was lower than ambient levels and would not be perceptible. The noise produced by a pump that generated 60 dBA would be reduced by 48 dBA at Red Hill Park, which could result in an increase that was greater than 5 dBA CNEL at the campground. This would be a significant impact when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM NOI-3: Control operational noise from the seawater pump. A variety of methods could be used to mitigate noise impacts from the seawater pump, including selecting a pump at the lower end of the noise range. If not feasible, noise levels will be monitored when recreational vehicles are present to establish the ambient conditions prior to construction. The pump will be located at a sufficient distance from the camping/recreational vehicle area so that noise levels do not exceed 5 dB more than the ambient levels. If not feasible, a noise barrier will be installed, and an acoustical engineer will verify the design to ensure that appropriate noise levels will be obtained.

Residual Impact

Implementation of MM NOI-3 would reduce construction and operations impacts to less than significant because noise levels would meet Imperial County's standards.

3.14.4.8 Alternative 5 – Alamo River, Pumped Diversion

Under Alternative 5, the seawater pump would be located in the seabed, well removed from noise-sensitive receptors. No impacts on noise-sensitive receptors would result from its construction and operation.

Impact NOI-1: Daytime construction and maintenance activities would cause a temporary increase in noise levels near the Project sites (less-than-significant impact). Table 3.14-11 shows the types of trucks and equipment that would be used during construction and maintenance. The discussion under Alternative 4 is applicable to this alternative.

Table 3.14-11 Alternative 5 – Estimated Equipment Use During Construction and Maintenance

	Habitat Construction			Annual Maintenance		
Equipment Type	Quantity	Hours/Day	Total Days*	Quantity	Hours/Day	Days/Year
On-Highway Tractor Trailer	18	8	886	1	8	20
Tractor Scraper	2	8	515	1	8	26
Dump Truck	7	8	1,752	1	8	18
Excavator	2	8	439	1	8	27
Bulldozer	2	8	203	1	8	5
Grader	1	8	19	1	8	25
Clamshell Derrick Rig	1	20	253	—	—	—
Hydraulic Dredge	1	8	91	—	—	—
Crane Rig	1	8	21	—	—	—
Backhoe	1	8	200	1	8	7
Tractor	—	—	—	1	8	3

* Total Days is the product of the quantity of equipment multiplied by the days each piece of equipment would be operating during construction.

Impact NOI-2: Dredging could extend beyond the hours typically allowed by Imperial County (significant impact). The discussion under Alternative 4 is applicable to this alternative.

Impact NOI-3: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents (less-than-significant impact). The discussion under Alternative 4 is applicable to this alternative.

Impact NOI-4: Noise from construction and operation of the seawater pipeline could exceed Imperial County's construction thresholds at Red Hill Park (significant impact). The discussion under Alternative 4 regarding the seawater pipeline is applicable to this alternative. MM NOI-2 is applicable to this alternative as well, and would reduce this impact to less than significant.

3.14.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Under this alternative, the seawater pump and associated pipeline would be well removed from any noise-sensitive receptors, and no impacts would result from their construction and operation.

Impact NOI-1: Construction and maintenance activities would cause a temporary increase in noise levels near the Project sites (less-than-significant impact). Table 3.14-12 shows the types of trucks and equipment that would be used during construction and maintenance. The discussion under Alternative 4 is applicable to this alternative.

Table 3.14-12 Alternative 6 – Estimated Equipment Use During Construction and Maintenance

	Habitat Construction			Annual Maintenance		
Equipment Type	Quantity	Hours/Day	Total Days*	Quantity	Hours/Day	Days/Year
On-Highway Tractor Trailer	24	8	1,210	1	8	26
Tractor Scraper	3	8	666	1	8	27
Dump Truck	10	8	2,387	1	8	18
Excavator	2	8	568	1	8	29
Bulldozer	2	8	267	1	8	5
Grader	1	8	22	1	8	25
Clamshell Derrick Rig	2	20	498	—	—	—
Hydraulic Dredge	1	8	91	—	—	—
Crane Rig	1	8	21	—	—	—
Backhoe	1	8	200	1	8	13
Tractor	—	—	—	1	8	3

* Total Days is the product of the quantity of equipment multiplied by the days each piece of equipment would be operating during construction.

Impact NOI-2: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents (less-than-significant impact). The discussion under Alternative 4 is applicable to this alternative.

Impact NOI-3: Construction truck traffic at some locations on local roads would cause a temporary increase in noise near residents (less-than-significant impact). The discussion under Alternative 4 is applicable to this alternative.

3.14.5 References

California Department of Water Resources (DWR) and California Department of Fish and Game (DFG). 2007. Salton Sea Restoration Ecosystem Program Final Programmatic Environmental Impact Report.

County of Imperial. 1997. Imperial County General Plan: Noise element. Website (http://www.icpds.com/?pid=571).

United States Army Corps of Engineers and Los Angeles Harbor Department. 2008. Port of Los Angeles channel deepening project Draft Supplemental Environmental Impact Statement/Environmental Impact Report.

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3.15 PALEONTOLOGICAL RESOURCES

This section evaluates the potential environmental impacts on paleontological resources that may result from construction of the Species Conservation Habitat (SCH) Project. Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on the earth. Fossils are paleontological resources that are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. They include mineralized, partly mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Fossils are considered nonrenewable resources because the organisms they represent no longer exist. Thus, once destroyed, fossils can never be replaced.

The Project would be located at the southern end of the Salton Sea in the areas that were recently or are currently submerged, and in the drainages, floodplains, and deltas of the New and Alamo rivers. This region of the Imperial Valley is used mostly for agriculture. The study area for paleontological resources is the area where ground disturbances may expose and affect buried and unknown paleontological resources.

Table 3.15-1 summarizes the potential impacts of the six Project alternatives on paleontological resources compared to both the existing conditions and the No Action Alternative.

Table 3.15-1 Summary of Impacts on Paleontological Resources

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact PALEO-1: Ground-disturbing activities could expose and damage undiscovered paleontological resources.	Existing Condition	S	S	S	S	S	S	MM PALEO-1: Prepare and implement a survey plan and a paleontological monitoring plan. MM PALEO-2: Conduct worker training. MM PALEO-3: Prepare and implement a paleontological resource data recovery plan.
	No Action	S	S	S	S	S	S	Same as Existing Condition

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.15.1 Regulatory Requirements

3.15.1.1 Federal Regulations

The Antiquities Act was the first law enacted to specifically establish that archaeological sites on public lands are important public resources, and it obligated Federal agencies that manage public lands to preserve the scientific, commemorative, and cultural values of such sites. This act does not refer to paleontological resources specially; however, the protection of "objects of antiquity" by various Federal agencies (understood to include paleontological resources) is included in the act.

National Historic Preservation Act of 1966

The National Historic Preservation Act of 1966 provides for the survey, recovery, and preservation of significant paleontological data when such data may be destroyed or lost due to a Federal, Federally licensed, or Federally funded project (Public Law 89 665; 80 Statute 915m 16 United States Code section 470 et seq.)

Department of the Interior Report-Fossils on Federal and Indian Lands 2000

In 2000, the Secretary of the Interior submitted a report to Congress entitled *Assessment of Fossil Management on Federal and Indian Lands* (United States Department of the Interior 2000). This report was prepared with the assistance of Federal agencies, including the United States (U.S.) Bureau of Indian Affairs, U.S. Bureau of Land Management, U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, U.S. Forest Service, U.S. Park Service, and U.S. Geological Survey, as well as the Smithsonian Institution. The report concluded that administrative and congressional actions with respect to fossils should be governed by seven basic principles:

- Fossils on Federal land are a part of America's heritage;
- Most vertebrate fossils are rare;
- Some invertebrate and plant fossils are rare;
- Penalties for fossil theft should be strengthened;
- Effective stewardship requires accurate information;
- Federal fossil collections should be preserved and available for research and public education; and
- Federal fossil management should emphasize opportunities for public involvement.

Paleontological Resources Preservation Act of 2009

The Paleontological Resources Preservation Act calls on the Secretary of the Interior to provide protection for vertebrate paleontological resources on Federal lands by limiting the collection of vertebrate fossils and scientifically important fossils to permitted and qualified researchers.

3.15.1.2 State Regulations

Public Resources Code

The California Public Resources Code has requirements for paleontological resource management (Chapter 1.7, section 5097.5, Archaeological, Paleontological, and Historic Sites). This statute specifies that state agencies may undertake surveys, excavations, and other operations as necessary on state lands

to preserve or record paleontological resources and defines any unauthorized disturbance or removal of a fossil site or remains on public land as a misdemeanor.

3.15.1.3 Other Guidance

Imperial County

The Imperial County General Plan (County of Imperial 1993) does not specifically address paleontological resources, but it emphasizes the conservation of historical and prehistoric resources.

Paleontological Resource Assessment Guidelines

The Society of Vertebrate Paleontology (SVP) has established standard guidelines (SVP 1995) that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (SVP 1991, 1996). Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements included in the guidelines. Regulatory agencies often accept and utilize the professional standards set forth by the SVP.

3.15.2 Affected Environment

3.15.2.1 Paleontological Resource Categories of Sensitivity

The SVP (1995) established three categories to be used for the purpose of assigning sensitivity, or the potential for a rock unit to yield significant paleontological resources: high, low, and undetermined. Each of these categories affects the degree to which paleontological mitigation is required.

High Potential. Rock units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been recovered are considered to have a high potential for containing significant nonrenewable fossiliferous resources. These units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontologic resources anywhere within their geographical extent and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas that contain potentially datable organic remains older than Recent, including deposits associated with nests or middens, and areas that may contain new vertebrate deposits, traces, or trackways are also classified as significant.

Low Potential. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow determination that some areas or units have low potential for yielding significant fossils. Such units will be poorly represented by specimens in institutional collections.

Undetermined Potential. Specific areas underlain by sedimentary rock units for which little information is available are considered to have undetermined fossiliferous potential.

In general terms, for geologic units with high potential, full-time monitoring for paleontological resources is typically recommended during any Project-related ground disturbance. For geologic units with low potential, protection or salvage efforts typically are not required. For geologic units with undetermined potential, field surveys by a qualified paleontologist are usually recommended to specifically determine the paleontologic potential of the rock unit or units present within the assessment area.

The study area is underlain near the surface by late Pleistocene and Holocene alluvial deposits. At depth it is underlain by the fossil-bearing Lake Cahuilla beds and, to a lesser extent, by the underlying Brawley Formation, which both have a high sensitivity or potential to yield significant paleontological resources.

3.15.2.2 Paleontological Resource Inventory Results

Site Geology and Paleontology

Quaternary Lake Deposits (Lake Cahuilla Beds)

First named by Blake (1854, 1907), the Quaternary lake deposits (Lake Cahuilla beds) in the northern side of the Imperial Valley consist of interbedded, lens-shaped, and tabular beds of silt, sand, and clay that are probably less than 100 feet thick. Because of faulting and deformation of the basin, the Lake Cahuilla beds could be thinner or thicker. Beach and nearshore deposits mantle the margin of the Salton Sea, while deepwater sediments of Lake Cahuilla that accumulated in the vast axial areas of the Salton Trough support the productive agricultural center of the Imperial and Coachella valleys (Waters 1983; California Department of Water Resources [DWR] and California Department of Fish and Game [DFG] 2007). The study area is directly underlain by Lake Cahuilla beds. Although modern in age at the surface, these lake/playa sediments increase in age with depth, and at lower reaches may be late Pleistocene in age (40,000 years or less) (Maloney 1986). According to Van de Camp (2006), the Lake Cahuilla bed sediments come from two sources. The first source was the Colorado River, which at many times in the past flowed intermittently into the southern portion of the Salton Trough and deposited sand, silt, and mud in deltaic (delta), fluvial (stream), and lacustrine (lake) environments. The second source was the sediments derived from the basin, which consist of aeolian (wind-blown) sediments and alluvial and fluvial sediments, which are coarser sediments such as sands and, to a lesser extent, pebbles, gravel, and cobbles. Together, these sediment packages chronicle repeated inundations by the Colorado River and subsequent desiccations of the basin.

A recent study by Li (2003) and Li et al. (2007) dating various layers of calcareous tufa[1] at Travertine Rock near Salton City found evidence of at least 30 basin filling lakes in the Salton Trough in the last 20,000 years. Evidence of these inundations and subsequent desiccations are chronicled in the sediments of the Lake Cahuilla beds. Only the last five to ten lake phases of the Lake Cahuilla bed sediments (from 400 to 5,000 years before present) have been studied in any detail in other areas of the Salton Trough, such as Coachella Valley and the eastern and western areas adjacent to the Imperial Valley (Bowersox 1972; Waters 1980, 1983; Reynolds 1989; Whistler et al. 1995; Quinn 2000; Jefferson 2005; Wagner 2007; Crull et al. 2008; Lander 2009), but the paleontological content of the later Pleistocene and Holocene Lake Cahuilla deposits in the axial or central part of the Imperial Valley are largely unknown (Jefferson 2007, 2010a, 2010b).

The sediments of the Lake Cahuilla beds tend to be highly fossiliferous and often preserve late Pleistocene and Holocene invertebrates (diatoms, pollen, foraminifera, ostracods, freshwater clams, and snails); small vertebrates (fish, amphibians, reptiles, birds, and small to medium-sized mammals); and larger mammal fossils, some of which are large extinct mammals.

Quaternary Brawley Formation

First described by Dibblee (1954), the Quaternary Brawley Formation that underlies the Quaternary Lake (Lake Cahuilla beds) deposits at depth consists of interbedded, reddish-brown to gray, poorly sorted, clayey silts, and fine sands. According to Proctor (1968), the Brawley Formation is at least 2,000 feet thick. Recent work on the Brawley Formation indicates that these sediments are from the Pleistocene and

[1] A carbonate coral-like rock that encrusts boulders along the shoreline of freshwater lakes.

range in age from about 1.1 to 1.2 million years (Dorsey 2006; Kirby et al. 2007) to about 40,000 years (Maloney 1986) before present.

Like the Lake Cahuilla beds, the Brawley Formation stratigraphic record represents a series of inundations of the Salton Trough by waters of the Colorado River. The river formed large freshwater to brackish lakes that persisted for some time and then disappeared with subsequent desiccations when the Colorado River was diverted back into its delta. The lithologic record of the Brawley Formation consists of alternating lacustrine (lake), fluvial (stream), and deltaic deposits, with subaerial (terrestrial) aeolian, playa (dry lake), and alluvial sediments. On the western side of the Salton Trough, paleontological evidence exists (echinoids [sand dollars, sea urchins] and foraminifers [microfossils]) of several possible marine incursions (Kirby el al. 2007).

The sediments of the Brawley Formation tend to be highly fossiliferous and often preserve late Pleistocene invertebrates (diatoms, pollen, foraminifera, ostracods, freshwater clams, and snails); small vertebrates (fish, amphibians, reptiles, birds, and small- to medium-sized mammals); and larger extinct mammal fossils.

Records and Literature Search

A paleontological records and literature search was conducted at the Colorado Desert District Stout Research Center (CDDSRC) for the potential Project sites. Also reviewed were pertinent published literature and unpublished manuscripts, the previously prepared *Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report* (PEIR) (DWR and DFG 2007), other related environmental documents, and other paleontological assessments. They included published articles on late Pleistocene vertebrate localities of California (Jefferson 1991a, 1991b). An online records search also was conducted at the Museum of Paleontology, University of California, Berkeley (2010).

The results of the CDDSRC search indicated that no previously known paleontological resource localities have been recorded within 1 mile of the proposed Project sites. It is important to note that none of the study area has been surveyed for surficial paleontological resources (Jefferson 2010b); however, the literature search revealed that during a paleontological resource field survey for the nearby proposed Salton Sea Unit 6 Generating Plant and Transmission Lines, three fossil mollusk sites were identified within Lake Cahuilla beds in the banks of irrigation ditches and New River drainage (Fisk 2002).

The online records search for microfossil, plant, invertebrate, and vertebrate localities conducted at the Museum of Paleontology, University of California, Berkeley indicated no previously recorded paleontological resources have been identified within 1 mile of the study area.

A search of the database of Late Pleistocene vertebrate localities of California (Jefferson 1991a, 1991b), which includes institutional records and published references, indicated no known paleontological resource localities are recorded within 1 mile of the study area.

3.15.3 Impacts and Mitigation Measures

3.15.3.1 Impact Analysis Methodology

The impact assessment methodology for paleontological resources follows guidelines provided by the SVP (1991, 1995). The assessment is based upon the potential for damage or disturbance as a result of ground-disturbing activities. Impacts would vary depending on the depth of construction required. Shallow excavation (e.g., 2 to 3 feet in depth) would have a low potential for causing impacts, while construction below 5 feet, such as required for the deeper pools within the ponds, interception ditch, brackish water pipeline, and sedimentation basin would have a greater potential for impacts. Much of the

Salton Sea basin, where the proposed Project sites are located, is underlain by sediments that are paleontologically sensitive (designated as having moderate to high paleontological sensitivity). Therefore, avoidance as a means to reduce or eliminate impacts on paleontological resources is not practical.

3.15.3.2 Thresholds of Significance

Significance Criteria

Impacts would be significant if the Project alternatives would cause:

- Physical damage to a scientifically useful fossil such that the data potential of that fossil is reduced or the specimen is destroyed; or unearthing of fossil(s) and removal from its stratigraphic context without appropriate scientific recordation of that context.

Application of Significance Criteria

The following summarizes the methodology used in applying the significance criteria to the Project alternatives:

Physical damage to scientifically useful fossils or unearthing and removing fossils without appropriate scientific recordation – The primary risks to fossils would result from damage during construction and possible looting of exposed fossils. A significant impact would occur if physical damage to a scientifically useful fossil occurred such that the data potential of that fossil were reduced, or the specimen were destroyed, and/or fossils were unearthed and removed from their stratigraphic context without appropriate scientific recordation of that context. This impact could result from construction-related excavations, unauthorized collection, or vandalism, or from erosion of paleontologically sensitive sediment unearthing and dispersing fossils (DWR and DFG 2007).

3.15.3.3 No Action Alternative

The description of the impacts of the No Action Alternative that is included in the PEIR is applicable to the SCH Project and summarized below (DWR and DFG 2007). This alternative would involve construction and operations and maintenance activities associated with pupfish channels and relocating recreational facilities as the Salton Sea recedes. Ground-disturbing activities that would occur under the No Action Alternative could result in physical damage to scientifically useful fossils, primarily near the eastern and western shorelines. Impacts also could result from the exposure and subsequent erosion of paleontologically sensitive sediment as the water recedes.

Under the No Action Alternative, paleontological surveys in areas with potential impacts directly attributable to the Imperial Irrigation District (IID) Water Conservation and Transfer Project would be conducted. In the event of a discovery during construction, all ground disturbances within 200 feet of the resource would be halted until the resource could be recovered by a qualified paleontologist.

The No Action Alternative would result in adverse impacts in comparison to existing conditions due to the disturbance of land in the sea bed and along the shoreline. The impacts would be partially mitigated as a result of the IID Water Conservation and Transfer Project mitigation measures between -235 and -248 feet mean sea level (msl). The area between the shoreline and -235 feet msl and below -248 feet msl that would be exposed under the No Action Alternative would not be subject to mitigation measures by IID.

3.15.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact PALEO-1: Ground-disturbing activities could expose and damage undiscovered paleontological resources (significant impact). Based on the records and literature searches, no known

paleontological resources have been exposed at the surface within the Project area (Jefferson 1991a, b, 2010b). In agricultural areas where the brackish water pipeline would be located, the underlying geology has been disturbed by repetitive plowing and other agricultural activities. Nonetheless, underlying geological formations present in the Project area are known to have a high sensitivity or potential to exist within the study area (DWR and DFG 2007; Jefferson 2010a, b). Potential is high that ground-disturbing activities, including pond excavations and brackish water pipeline construction, may expose and damage or remove from their stratigraphic context buried and unknown paleontological resources in the Lake Cahuilla beds and, to a lesser extent, in the Brawley Formation. They could include scientifically useful fossils, and impacts would be significant when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

MM PALEO-1: Prepare and implement a survey plan and a paleontological monitoring plan. A plan for the survey of Project areas will be prepared to facilitate identification of paleontological resources prior to initiation of ground-disturbing activities. Additionally, prior to construction, a certified paleontologist retained by the lead agencies will supervise monitoring of construction excavations and produce a Paleontological Resource Management Recovery Plan. Paleontological monitoring will include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. The monitor will have authority to temporarily divert grading away from exposed fossils to recover the fossil specimens. Monitoring will take place on a full-time basis when construction occurs at depths greater than 5 feet, part-time (4 hours a day) when excavations exceed 2 feet, and on a spot-check basis on excavations less than 2 feet. The paleontologist will document interim results of the construction monitoring program with monthly progress reports. Additionally, at each fossil locality, field data forms will record that locality, stratigraphic columns will be measured, and appropriate scientific samples will be submitted for analysis.

MM PALEO-2: Conduct worker training. Construction supervisors and crew will receive training by a certified paleontologist in the procedures for identifying and protecting paleontological resources, as well as procedures to be implemented in the event fossil remains are encountered during ground-disturbing activities.

MM PALEO-3: Prepare and implement a paleontological resource data recovery plan. If fossils are encountered during construction, construction activities will be temporarily diverted from the discovery, and the monitor will notify all concerned parties and collect matrix for testing and processing as directed by the Project paleontologist. To expedite removal of fossil-bearing matrix, the monitor will be empowered to request heavy machinery to assist in moving large quantities of matrix out of the path of construction to designated stockpile areas. Construction will resume at the discovery location once all the necessary matrix is stockpiled, as determined by the paleontological monitor. Testing of stockpiles will consist of screen washing small samples to determine if important fossils are present. If such fossils are present, the additional matrix from the stockpiles will be water screened to ensure recovery of a scientifically significant sample. Samples collected will be limited to a maximum of 6,000 pounds per locality.

The Project paleontologist will direct identification, laboratory processing, cataloguing, analysis, and documentation of the fossil collections. When appropriate, splits of rock or sediment samples will be submitted to commercial laboratories for microfossil, pollen, or radiometric dating analysis. Prior to construction, the lead agencies will enter into a formal agreement with a recognized museum repository and will curate the fossil collections, appropriate field and laboratory documentation, and the final Paleontological Resource Recovery Report in a timely manner following construction. A final technical report will be prepared to summarize construction monitoring and present the results of the fossil

recovery program. The report will be prepared in accordance with SVP guidelines and lead agency requirements. The final report will be submitted to the lead agency and the curation repository.

Residual Impacts

Implementation of MM PALEO-1 through 3 would reduce impacts on paleontological resources to a less-than-significant level because appropriate measures would be taken to prevent physical damage to a scientifically useful fossil, recover data from uncovered fossils, and prevent looting through worker education.

3.15.3.5 Alternative 2 – New River, Pumped Diversion

Impact PALEO-1: Ground-disturbing activities could expose and damage undiscovered paleontological resources (significant impact). The discussion under Alternative 1 is applicable to this alternative, although excavation would not be required for brackish water pipeline construction; therefore, the potential for impacts would be somewhat reduced. MMs PALEO-1 through 3 also are applicable to this alternative and would reduce this impact to less than significant.

3.15.3.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact PALEO-1: Ground-disturbing activities could expose and damage undiscovered paleontological resources (significant impact). The discussion under Alternative 1 is applicable to this alternative, although excavation would not be required for brackish water pipeline construction; therefore, the potential for impacts would be somewhat reduced. MMs PALEO-1 through 3 also are applicable to this alternative and would reduce this impact to less than significant.

3.15.3.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact PALEO-1: Ground-disturbing activities could expose and damage undiscovered paleontological resources (significant impact). The discussion under Alternative 1 is applicable to this alternative. MMs PALEO-1 through 3 also are applicable to this alternative and would reduce this impact to less than significant.

3.15.3.8 Alternative 5 – Alamo River, Pumped Diversion

Impact PALEO-1: Ground-disturbing activities could expose and damage undiscovered paleontological resources (significant impact). The discussion under Alternative 1 is applicable to this alternative, although excavation would not be required for brackish water pipeline construction; therefore, the potential for impacts would be somewhat reduced. MMs PALEO-1 through 3 also are applicable to this alternative and would reduce this impact to less than significant.

3.15.3.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact PALEO-1: Ground-disturbing activities could expose and damage undiscovered paleontological resources (significant impact). The discussion under Alternative 1 is applicable to this alternative, although excavation would not be required for brackish water pipeline construction; therefore, the potential for impacts would be somewhat reduced. Mitigation MMs PALEO-1 through 3 also are applicable to this alternative and would reduce this impact to less than significant.

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3.16 POPULATION AND HOUSING

3.16.1 Introduction

This section discusses the potential for the Species Conservation Habitat (SCH) Project to result in temporary and long-term increases in population and increased demand for housing. The study area for population and housing is Imperial County, including both the unincorporated communities as well as the cities of Brawley, Calexico, Calipatria, El Centro, Holtville, Imperial, and Westmorland. This study area was selected because the Project would be located in Imperial County and most workers would be likely to reside here.

Table 3.16-1 summarizes the impacts of each of the six Project alternatives on population and housing in comparison to both the existing conditions and the No Action Alternative.

Table 3.16-1 Summary of Impacts on Population and Housing

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact POP-1: Out-of-town construction workers would cause a temporary, slight increase in Imperial County population.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact POP-2: Project operation would increase opportunities for passive recreational activity and research due at the SCH ponds, which could result in increased visitor days.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.16.2 Regulatory Requirements

No state or Federal regulatory requirements regarding population and housing are applicable to the SCH Project. The Housing Use and Land elements of the Imperial County General Plan (County of Imperial 2008a and 2008b) include a number of goals, objectives, and policies that focus on providing adequate housing to meet the needs of county residents.

3.16.3 Affected Environment

3.16.3.1 Population

Imperial County has been a predominantly rural, agricultural region for more than 100 years, but its population has been growing over the past 30 years. In 1980, the population was 92,110 (Southern California Association of Governments [SCAG] 2010). The last official census in 2000 showed a population of 142,361, while more recent estimates calculated the 2010 population at 183,029 (United States Census Bureau 2010a; California Department of Finance 2010a). The largest population centers are found in Brawley, El Centro and Calexico, with almost 40 percent of the county's population in these

three cities. Approximately 21 percent of Imperial County's population is located in unincorporated areas (SCAG 2010). Population in unincorporated areas of the county tends to concentrate in agricultural areas and in recreation/retirement communities. Communities located on the shores of the Salton Sea, including Salton City, Salton Sea Beach, and Bombay Beach are primarily recreation-based communities, although their populations increasingly are becoming more diversified. These communities experience a notable increase in population during the winter months when visitors converge to avoid cold/wet winters in other parts of the country (County of Imperial 2008).

3.16.3.2 Housing

In 2009, Imperial County had approximately 54,900 housing units, of which nearly 21 percent were in multi-unit structures (United States Census Bureau 2010b; California Department of Finance 2010b). Approximately 46 percent of the housing units are occupied by renters. In 2008, the most current year for which information is available, nearly 14 percent of the housing units were vacant. About 14,700 housing units, or 27 percent of the county's total, are located in El Centro, and 10,000 housing units, or 18 percent of the county's total, are located in Calexico. Similar to the county as a whole, 46 to 47 percent of these units are occupied by renters. Imperial has a vacancy rate of nearly 14 percent, which is also similar to the entire county, although Calexico has only a 7 percent vacancy rate (United States Census Bureau 2010a).

Temporary housing areas are located throughout the county, including recreational vehicle (RV) parks, mobile home parks, and campgrounds. Red Hill Park is located immediately adjacent to the Alamo River mouth and includes RV hookups in addition to a camping area, restrooms, ramadas and picnic tables. The park is the most accessible temporary housing area to the proposed Project sites (County of Imperial 2010a). The Fountain of Youth Spa, located in Niland, is the largest temporary housing area in the county, with 212 mobile homes and 785 RV spaces. The Oasis Mobile Village, also in Niland, has 73 mobile homes and the Del Yermo RV Park in Calipatria has 45 RV spaces. Brawley has more than 85 RV spaces and 188 mobile homes spread across the Brawley RV Park and mobile home park, Tangerine Gardens mobile home park, Palm Lane RV park, and Smyth mobile home park (County of Imperial 2010b). Finally, camping opportunities are present on state and Federal lands and through private recreational resources. Campgrounds include the Salton Sea State Recreation Area, Salt Creek Campground, and Glamis North KOA Campground.

3.16.4 Impacts and Mitigation Measures

3.16.4.1 Impact Analysis Methodology

Impacts on population and housing were assessed by comparing the numbers of temporary and permanent workers required to construct and operate the SCH Project to the available labor pool and housing resources in the study area and also by considering whether the Project could indirectly affect population and housing by attracting more residents. Most of the heavy equipment and the operators of this equipment would likely be brought in from the San Diego area, although specialized equipment such as a clamshell derrick and tractor scraper units and excavators could come from the San Francisco Bay Area and/or the Sacramento area. Truck drivers and most other construction workers would likely be from the local area in Imperial County. Impacts of each of the Project alternatives were compared to both the existing environmental setting and the No Action Alternative.

3.16.4.2 Thresholds of Significance

Significance Criteria

Impacts would be significant if the Project alternatives would:

- Induce population growth either directly or indirectly;

- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Application of Significance Criteria

The following summarizes the overall methodology used in applying the significance criteria to the Project alternatives:

- **Induce Population Growth** – The analysis considers whether the need for construction workers would generate substantial population growth in Imperial County. The equivalent of two jobs would be created during the operational phase, which would have an imperceptible effect on population levels; therefore, operational impacts are not discussed further. The analysis also considers whether the Project could indirectly cause an increase in population through increased recreational opportunities.
- **Displace Substantial Populations or Housing** – The proposed facilities would be located in currently submerged or recently exposed areas of the Salton Sea or in agricultural areas where there are no housing units; therefore, the Project would not displace any existing housing. There is a potential for encampments to be present near the riverbanks, but these would most likely be temporary given the harsh weather conditions (i.e., intense heat and flash flooding) and occupied by only a few individuals. Although construction activity would likely discourage any individuals from settling within the area near or in the Project site, implementation of the SCH Project would not displace substantial numbers of existing housing nor displace substantial numbers of people and would not necessitate the construction of housing elsewhere. Therefore, this impact is not considered further.

3.16.4.3 No Action Alternative

At the time of Project construction (expected to begin in late 2012), population and housing conditions would likely be substantially similar to those described under the Affected Environment above, although some fluctuations would be expected; as noted above, population levels have been increasing, and it is possible that housing may increase as well. Declining inflows in future years from various factors would result in collapse of the Salton Sea ecosystem due to increasing salinity and other water quality issues, such as temperature, eutrophication and related anoxia, and algal productivity. This collapse is unlikely to have a substantive impact on population and housing in Imperial County as a whole, most of which is not present in the immediate vicinity of the Salton Sea. The declining water elevation and loss of the fish and birds at the Sea would likely make living near the Sea less desirable and could result in a population decline in communities such as Bombay Beach and Salton City that are located on the existing shores of the Salton Sea. Recreational opportunities at the Salton Sea would be reduced, which could affect employment opportunities near the Sea and affect further reduce population in the vicinity.

3.16.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact POP-1: Out-of-town construction workers would cause a temporary, slight increase in Imperial County population (less than significant impact). Construction of the SCH Project would last approximately 2 years, during which time it is estimated that approximately 97 construction workers would be required. Of these, it is estimated that approximately 50 would be truck drivers, 6 would be laborers, 3 would be foremen, and 2 would be managers. It is assumed that these construction workers would be drawn from the local population and would not affect population levels. As shown in Table 3.19-2, a pool of nearly 4,700 construction and transportation workers is available in Imperial County to

help meet the needs of the Project, and the current unemployment rate in Imperial County is approximately 29.2 percent (California Economic Development Department 2010). Therefore, an adequate number of workers would be available locally to satisfy labor requirements during Project construction.

In addition to the local workforce, it is assumed that heavy equipment and the operators of that equipment would be brought in from other major metropolitan areas (e.g., San Diego, Sacramento, or San Francisco).Given the estimated 2-year construction period, these heavy equipment operators could temporarily relocate their families. It is estimated that about 36 equipment operators would be required during construction and adequate temporary housing is available in Imperial County. This temporary and minor increase in local population would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Impact POP-2: The Project operation would increase opportunities for passive recreational activity and research due at the SCH ponds, which could result in increased visitor days (less-than-significant impact). Implementation of Alternative 1 would restore approximately 3,130 acres of habitat to provide for the long-term viability of a portion of the fish-eating bird populations at the Salton Sea. Implementation of Alternative 1 would continue, and potentially enhance, recreational opportunities such as birding, hiking and photography (that would likely diminish and eventually be eliminated under the No Action Alternative). The newly restored habitat would be concentrated in a relatively small area, however, and would not result in any long-term changes in population in the surrounding areas. When compared to both the existing environmental setting and the No Action Alternative, impacts would be less than significant.

3.16.4.5 Alternative 2 – New River, Pumped Diversion

Impact POP-1: Out-of-town construction workers would cause a temporary, slight increase in Imperial County population (less-than-significant impact). This impact is applicable to Alternative 2, although is it estimated that this alternative would only require up to 77 construction workers, of which 27 would be heavy equipment operators.

Impact POP-2: The Project operation would increase opportunities for passive recreational activity and research due at the SCH ponds, which could result in increased visitor days (less-than-significant impact). This impact is applicable to Alternative 2, although less habitat would be restored (2,670 acres as opposed to 3,130 acres).

3.16.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact POP-1: Out-of-town construction workers would cause a temporary, slight increase in Imperial County population (less-than-significant impact). This impact is applicable to Alternative 3, although 115 construction workers would be required, of which 44 would be heavy equipment operators. This short term increase would still be relatively small compared to the overall population and impacts would remain less than significant.

Impact POP-2: The Project operation would increase opportunities for passive recreational activity and research due at the SCH ponds, which could result in increased visitor days (less-than-significant impact). This impact is applicable to Alternative 3, although more habitat would be restored (3,770 acres as opposed to 3,130 acres).

3.16.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact POP-1: Out-of-town construction workers would cause a temporary, slight increase in Imperial County population (less-than-significant impact). This impact is applicable to Alternative 4, although it is estimated that only 47 construction workers would be required, of which 17 would be heavy equipment operators.

Impact POP-2: The Project operation would increase opportunities for passive recreational activity and research due at the SCH ponds, which could result in increased visitor days (less-than-significant impact). This impact is applicable to Alternative 4, although less habitat would be restored (2,290 acres as opposed to 3,130 acres).

3.16.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact POP-1: Out-of-town construction workers would cause a temporary, slight increase in Imperial County population (less-than-significant impact). This impact is applicable to Alternative 5, although it is estimated that only 43 construction workers would be required over a 2-year period, of which 15 would be heavy equipment operators.

Impact POP-2: The Project operation would increase opportunities for passive recreational activity and research due at the SCH ponds, which could result in increased visitor days (less than significant impact). This impact is applicable to Alternative 5, although less habitat would be restored (2,080 acres as opposed to 3,130 acres).

3.16.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact POP-1: Out-of-town construction workers would cause a temporary, slight increase in Imperial County population (less-than-significant impact). This impact is applicable to Alternative 6, although only 58 construction workers would be required over a 2-year period, of which 24 would be heavy equipment operators.

Impact POP-2: The Project operation would increase opportunities for passive recreational activity and research due at the SCH ponds, which could result in increased visitor days (less-than-significant impact). This impact is applicable to Alternative 6, although less habitat would be restored (2,940 acres as opposed to 3,130 acres).

3.16.5 References

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3.17 PUBLIC SERVICES

3.17.1 Introduction

This section discusses the potential for the Species Conservation Habitat (SCH) Project to result in temporary and long-term demands on public services such as police and fire protection and trauma centers. The study area for public services includes Imperial County and the communities near the Salton Sea that would provide emergency medical services.

Table 3.17-1 summarizes the impacts of the six Project alternatives on public services compared to both the existing conditions and the No Action Alternative.

Table 3.17-1 Summary of Impacts on Public Services

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact PS-1: Construction and maintenance activities could result in increased demand for emergency services (police, fire, and trauma centers), as could increased use of the Project site by recreational visitors.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.17.2 Regulatory Requirements

No state or Federal regulatory requirements regarding public services are applicable to the SCH Project. The Land Use Element of the Imperial County General Plan (County of Imperial 2008) includes a number of goals, objectives, and policies that focus on providing adequate public services to county residents.

3.17.3 Affected Environment

3.17.3.1 Police Protection

Imperial County Sheriff's Department is responsible for law enforcement in the county's unincorporated portions, including the areas where the proposed SCH Project sites are located. Imperial County Sheriff's Department is headquartered in El Centro. Nine additional command staff supports the sheriff. The Patrol Division is divided into the North County Patrol, South County Patrol, Palo Verde Patrol, and Winterhaven Patrol. Substations for the Sheriff's Office are located in Salton City, Brawley, Winterhaven, Palo Verde, and Niland. The substations are not staffed at all times, but officers patrol the communities and surrounding areas continuously (Imperial County Sheriff's Office 2009; personal communication, A. Gomez 2010).

3.17.3.2 Fire Protection

Imperial County Fire Department is responsible for fire protection in the county's unincorporated portions. Some communities, such as Salton Sea Beach, maintain volunteer fire departments or supplement the fire departments with volunteer firefighters. Response times vary according to location (personal communications, J. Zendejas and M. York 2010). Mutual aid agreements have been established between Imperial County and area cities, thus providing additional support. The City of Imperial contracts with Imperial County Fire Department and maintains three fire captains, six firefighters, and one deputy fire chief. Three engine crewmembers are on duty at all times and a Duty Fire Chief supervises daily operations. The City of Imperial houses one new front line fire engine and one reserve fire engine (City of Imperial Fire Department 2010). The City of Westmorland maintains 22 volunteers and 1 part-time fire chief serving within the city limits as well as other county areas. Response time within the city's municipal limits is approximately 4 minutes. The City of Westmorland contracts with Imperial County to receive certain fire protection equipment in exchange for fire protection services (City of Westmorland 2010). The City of Brawley maintains 14 full-time firefighter personnel with 5 firefighters on duty at all times and 25 reserve firefighter personnel. The department houses four engines: three city engines and one county engine. Call response times within the city of Brawley municipal limits ranges from 2 to 7 minutes.

3.17.3.3 Emergency Services

The hospitals nearest the Salton Sea are Pioneer Memorial Hospital in Brawley and El Centro Regional Medical Center in El Centro. Pioneer Memorial Hospital is a 107-bed acute care facility that maintains a 16-bed emergency department staffed by a physician 24 hours a day. The emergency facility is a Level IV[1] trauma center and maintains an average door-to-doctor time of 20 minutes (Pioneer Memorial Hospital 2010). El Centro Regional Medical Center is a 165-bed general acute care facility that has the only rooftop hospital heliport in Imperial County, facilitating transport to and from the facility in emergency situations. El Centro Regional Medical Center Emergency Department is classified as a Level II, Basic Emergency Medical Service and maintains 20 beds. The Emergency Department is open 24 hours a day and is staffed with a minimum of two physicians (El Centro Regional Medical Center 2010).

3.17.4 Impacts and Mitigation Measures

3.17.4.1 Impact Analysis Methodology

The impact assessment was based on a comparison of the demand for utilities and service systems resulting from the SCH alternatives to the existing capacity.

3.17.4.2 Thresholds of Significance

Significance Criteria

Impacts would be significant if the Project alternatives would:

- Result in substantial adverse physical impacts on or require new or physically altered government facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, trauma centers, schools, parks, and other public facilities.

[1] A Level IV trauma center is a rural facility that (1) supplements care within a larger trauma system; (2) provides initial evaluation and assessment of injured patients; (3) must have 24-hour emergency coverage by a physician; and (4) has transfer agreements and a good working relationship with the nearest Level I, II, or II center.

Application of Significance Criteria

A summary of the overall methodology used in applying the significance criteria to the Project alternatives follows:

- **Results in impacts on or requires new or altered facilities for fire and police protection, trauma centers, schools, or other public facilities –** The primary risks to public services would be associated with accidents that could occur at construction sites, on roadways due to construction, or due to maintenance activities. It is estimated that fewer than 50 out-of-town construction workers and their families could temporarily reside in the areas surrounding the Salton Sea during the 2-year construction period. Only a small number of employees would be required during operations. These minor increases in population would not increase demands on schools, libraries, parks, or other public facilities such that substantial adverse physical impacts would occur or new or physically altered government facilities would be required. Therefore, this analysis focuses on potential impacts to fire and police protection and emergency services that may be required.

3.17.4.3 No Action Alternative

As described in the *Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report* (California Department of Water Resources and California Department of Fish and Game 2007), the No Action Alternative would involve construction and operations and maintenance activities for pupfish channels. Additionally, Imperial Irrigation District (IID), as mitigation for the IID Water Conservation and Transfer Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at the Salton Sea State Recreation Area, as well as boat launches along the shoreline.

Construction and operations and maintenance activities under the No Action Alternative could result in increased traffic accidents, construction accidents, and fire and chemical hazards at the construction site and on the roads due to the construction activity. The amount of construction activity could also increase the need for police services due to trespassing and theft.

3.17.4.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact PS-1: Construction and maintenance activities could result in increased demand for emergency services (police, fire, and trauma centers), as could increased use of the Project site by recreational visitors (less-than-significant impact). Construction and maintenance activities could result in an increased potential for traffic accidents, construction accidents, and fire and chemical hazards at the construction site and on the roads due to construction/maintenance activity. The amount of construction/maintenance activity could also increase the need for police services due to trespassing and/or theft of construction materials or equipment. The Project does not include any unusually dangerous activities, however, and the increased demand associated with construction/maintenance activities would be within the capacity of local emergency service providers. As discussed above, the No Action Alternative would include construction/maintenance activities that would also increase the demand for emergency services, but they would be spread out over a long period of time and like the SCH Project, would not include unusually dangerous activities. The increased demand would not be expected to affect the ability of providers to maintain their current level of service or require new or altered facilities. Impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

As discussed in Section 3.18, Recreation, the Project would allow the public access to the pond sites to engage in recreational activities such as hiking, bird-watching, and nonmotorized watercraft use to the extent that these activities were compatible with the Project's goals and objectives. These activities are

not particularly risky, and while the demand for emergency services may increase as a result of the increased activities, the demand would not be expected to affect the ability of providers to maintain their current level of service or require new or altered facilities. Waterfowl hunting also would be allowed consistent with the protection of other avian resources, but also would not be expected to significantly affect levels of service. In 2006, 219 nonfatal and 27 fatal hunting incidents occurred in the United States, and only ten of these accidents occurred in California (International Hunter Education Association 2011). In 2007, 220 nonfatal and 19 fatal hunting accidents occurred in the United States, and five of these accidents occurred in California (International Hunter Education Association 2011). Therefore, the risk of an accident is low. Impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

3.17.4.5 Alternative 2 – New River, Pumped Diversion

Impact PS-1: Construction and maintenance activities could result in increased demand for emergency services (police, fire, and trauma centers), as could increased use of the Project site by recreational visitors (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.17.4.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact PS-1: Construction and maintenance activities could result in increased demand for emergency services (police, fire, and trauma centers), as could increased use of the Project site by recreational visitors (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.17.4.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact PS-1: Construction and maintenance activities could result in increased demand for emergency services (police, fire, and trauma centers), as could increased use of the Project site by recreational visitors (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.17.4.8 Alternative 5 – Alamo River, Pumped Diversion

Impact PS-1: Construction and maintenance activities could result in increased demand for emergency services (police, fire, and trauma centers), as could increased use of the Project site by recreational visitors (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.17.4.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact PS-1: Construction and maintenance activities could result in increased demand for emergency services (police, fire, and trauma centers), as could increased use of the Project site by recreational visitors (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.17.5 References

California Department of Water Resources and California Department of Fish and Game. 2007. Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report.

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3.18 RECREATION

This section focuses on potential changes to recreational uses at the Salton Sea, which are closely related to the state of fish and wildlife habitat. The study area includes the sites where the Species Conservation Habitat (SCH) Project would be implemented and nearby recreational areas.

Table 3.18-1 summarizes the impacts of the six Project alternatives on recreational resources, compared to both the existing conditions and the No Action Alternative.

Table 3.18-1 Summary of Impacts on Recreation

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact REC-1: The SCH Project would create recreational opportunities at the pond sites.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.18.1 Regulatory Requirements

Recreational resources in the study area are subject to the regulations of Federal, state, or local agencies, depending on jurisdiction. For example, the State of California regulates State Recreation Areas (SRAs), and the Federal government regulates National Wildlife Refuges (NWRs).

3.18.2 Affected Environment

The predominant recreational activities at the Salton Sea include bird-watching, wildlife observation, camping, hiking, picnicking, and hunting. Historically, the Salton Sea provided a variety of recreational opportunities, including swimming, water skiing, sport fishing, and boating. In recent years, however, recreational use at the Salton Sea has decreased noticeably, most likely due to a perception of deteriorating water quality and odors, the decline of the sport fishery, and the declining surface water elevation. Starting in 2000, all sport fish populations underwent a dramatic reduction. Marine sport fish species have been undetectable in California Department of Fish and Game (DFG) gill net sampling since mid-May 2003. In addition, none have been detected in fish kills or presented by anglers since mid-May 2003. In response to the loss of the marine sport fish, angling and recreational boating has virtually ceased at the Salton Sea (California Department of Water Resources [DWR] and DFG 2007). Of eight boat-launching facilities that were active in the 1980s, today only two are active (Varner Harbor at the Salton Sea SRA Headquarters and the Obsidian Butte boat launch). On most days, no boats or other watercraft are present on the Salton Sea. The few boats that are observed on the Salton Sea are primarily research vessels (personal communication, J. Crayon 2011).

Figure 3.18-1 shows the major recreational facilities around the entire Salton Sea. The Red Hill Park, which includes an inactive marina, is located immediately north of the second unit of the Sonny Bono Salton Sea NWR adjacent to the Alamo River mouth. Red Hill was originally an island connected to land by a causeway extending out from Garst Road; however, due to declining water levels, the areas between the island and mainland are exposed playa and salt flats that are no longer submerged beneath the Sea. The marina is located on the western side of the island and is no longer operational because of declining water levels. Anglers launch their boats by trailering them to the water's edge. Remnants of two docks remain at the marina site. The site continues to support picnic facilities; however, they are no longer located along the shoreline of the Salton Sea. A campground, including recreational vehicle hookups and additional picnic facilities, is located on the northern and eastern sides of Red Hill Island.

Figure 2-2 shows the relationship of the proposed SCH pond sites to the nearby NWR and Imperial Wildlife Area. The Sonny Bono Salton Sea NWR was established in 1930 as a refuge and breeding habitat for wildlife and is operated by the U.S. Fish and Wildlife Service. Most of the refuge is inundated by the Salton Sea. Along the shoreline, the refuge includes upland forage and freshwater marsh areas. This portion of land adjacent to the Salton Sea is an important part of the Pacific Flyway and is considered one of the premier bird-watching locations in the nation. The refuge, which receives approximately 20,000 visitors a year, (personal communication, C. Schoneman 2011) also includes nature trails and provides opportunities for photography, picnicking, and waterfowl hunting. Public access to the shoreline is provided at observation towers, viewing blinds, observation trails, and an interpretive center; the only other areas open to the public are portions of Union Tract and Hazard Unit, which are available for hunting from November to January.

Imperial Wildlife Area consists of three units that are owned by DFG; these include the Wister Unit, Finney-Ramer Unit, and Hazard Unit, although the U.S. Fish and Wildlife Service has maintained management and administrative authority of the Hazard Unit for decades by agreement with DFG. The units are primarily composed of low-lying land that provide habitat for migratory waterfowl. Finney-Ramer Unit is located south of the Salton Sea and the City of Calipatria, near the Alamo River. Originally established as a waterfowl refuge by the U.S. Bureau of Reclamation, this unit consists of 2,047 acres, including four lakes. Wister (5,243 acres) and Hazard (535 acres) units consist of upland habitat and managed wetlands, primarily to provide waterfowl forage.

Recreational opportunities near the proposed SCH sites at the New and Alamo rivers include a popular hunting spot containing duck blinds at Morton Bay, which is north of the Alamo River. New duck blinds are being placed in Morton Bay as the Sea recedes. Hunting also occurs on lands owned by the Imperial Irrigation District (IID). Although it is not IID's policy to allow hunting on their lands, it does occur during the waterfowl hunting season, particularly at IID's Managed Marsh Complex. If waterfowl hunting does occur on IID-owned lands, the hunters must follow the State of California hunting regulations (e.g., cannot shoot guns containing lead shot over surface water bodies) and hunt during state-mandated hunting seasons applicable to Southern California (personal communication, B. Wilcox 2011).

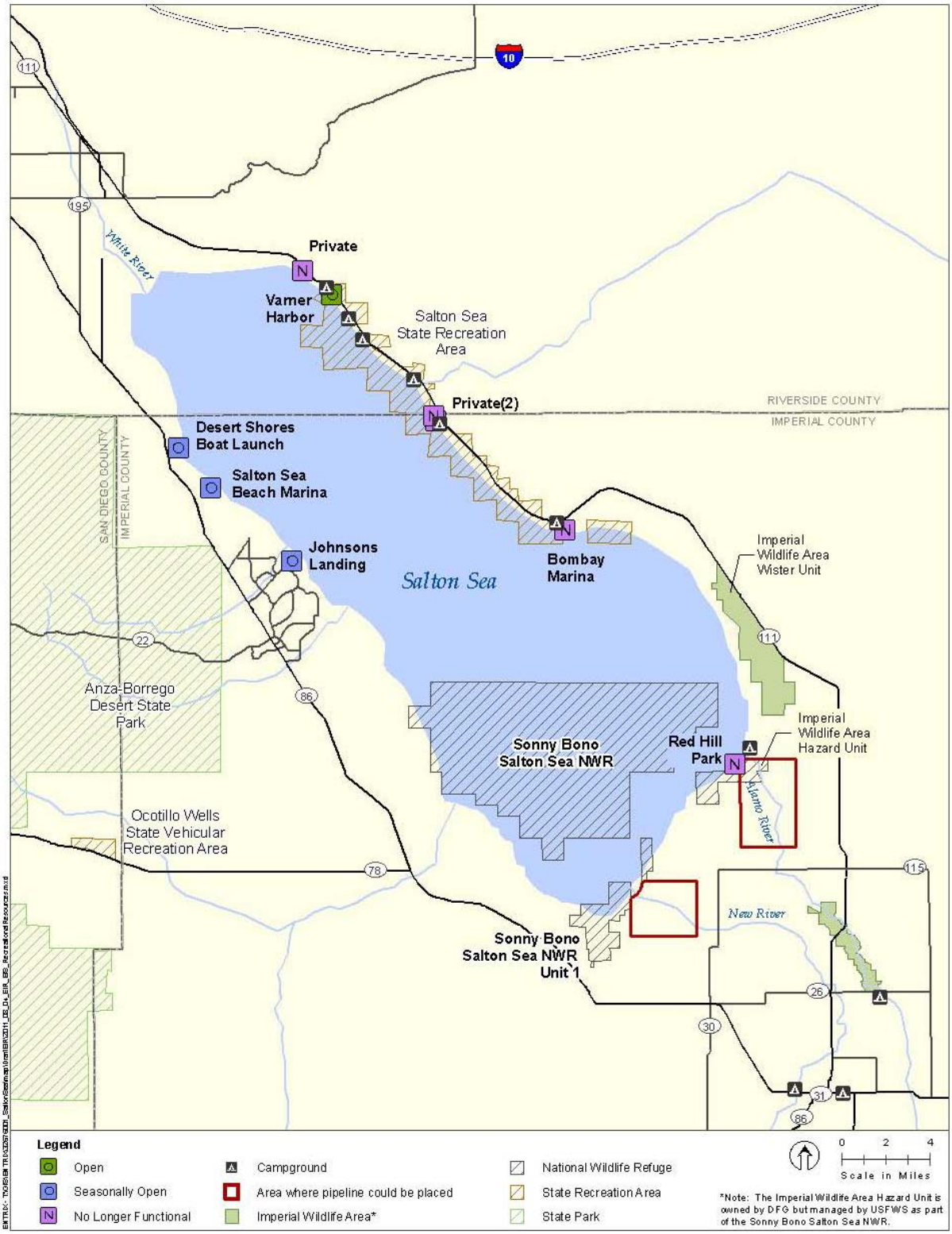

Figure 3.18-1 Recreational Resources at the Salton Sea

3.18.3 Impacts and Mitigation Measures

3.18.3.1 Impact Analysis Methodology

Impacts on existing recreational resources are evaluated based on the changes to the size, function, or access to existing recreational resources under each of the alternatives.

3.18.3.2 Thresholds of Significance

Significance Criteria

Impacts on recreational resources would be significant if the SCH Project would:

- Result in increased use of existing neighborhood and regional parks or other recreational facilities such that substantial deterioration of the facility would occur or be accelerated;
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment; or
- Result in a substantial adverse change in recreational opportunities.

Application of Significance Criteria

A summary of the overall methodology used in applying the significance criteria to the Project alternatives follows:

- **Increase use of existing recreational facilities** –The SCH Project would not result in population increases that would result in increased use of neighborhood and regional parks or other recreational facilities (refer to Section 3.16, Population and Housing). Thus, this criterion is not considered further.
- **Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical environmental effect** – The Project would be designed to allow some recreational opportunities, and the impacts from such activities are addressed in this Environmental Impact Statement/Environmental Impact Report. The Project would not require the construction or expansion of other recreational facilities, and this impact is not discussed further.
- **Substantially and adversely change recreational opportunities** – This impact is considered below because the Project would create recreational opportunities in areas where some opportunities currently exist.

3.18.3.3 No Action Alternative

As discussed in the Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report (DWR and DFG 2007), recreational opportunities under the No Action Alternative will change as the salinity of the Salton Sea increases and the fish population declines. The potential exists that some fish, such as tilapia, could occur at the estuaries of the New, Alamo, and Whitewater rivers where salinity will be lower.

Many of the recreational facilities are currently located adjacent to the shoreline. As the water elevation declines, the distance between the existing facilities and the open water will increase. Under the No Action Alternative, IID, as mitigation for the IID Water Conservation and Transfer Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at the Salton Sea SRA, as well boat launches along the shoreline. The facilities must be relocated as the water recedes until the water surface elevation is at -248 feet mean sea level, or the elevation directly attributable to the

IID Water Conservation and Transfer Project. Therefore, by 2078, under the No Action Alternative, these modified facilities would be separated from the Salton Sea by about 2 feet.

Waterfowl hunting activities at the Salton Sea are concentrated on Federal- and State-managed wetlands (Sonny Bono Salton Sea NWR and Imperial Wildlife Area) and private duck clubs in the Coachella and Imperial valleys. They are freshwater environments managed primarily for attracting and supporting waterfowl. While the waterfowl species sought by hunters (primarily dabbling ducks and snow geese) use the Sea's shoreline, the Federal and State wetlands and duck clubs have areas that are managed for specifically for waterfowl. As the Salton Sea recedes and becomes more saline under the No Action Alternative, use of the Sea by waterfowl could decline. In addition, many duck-hunting blinds would become stranded and hunting opportunities in the Salton Sea would be reduced. Bird-watching opportunities also could be reduced as compared to existing conditions.

3.18.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact REC-1: The SCH Project would create recreational opportunities at the pond sites (beneficial impact). The SCH Project is not specifically designed to accommodate recreation because the provision of recreational opportunities is not a Project goal. Nevertheless, some recreational activities would be available to the extent that they are compatible with the management of the SCH ponds as habitat for piscivorous (fish-eating) birds dependent on the Salton Sea.

Public access would be allowed to facilitate day use, hiking, bird-watching, and nonmotorized watercraft use. However, management plans may require that certain areas be seasonally closed to human activities to avoid disturbance of sensitive birds. When bird nesting was observed by SCH managers, human approach would be limited by posted signs. Hours of public access could be restricted to early morning during hot weather when nesting birds are present.

Fish would not be intentionally stocked for the purpose of providing angling opportunities. Nevertheless, such opportunities may be provided at the SCH ponds, in particular for tilapia. Fish populations would be monitored as a metric of the SCH Project's success. If populations became well established and appeared to provide fish in excess of what birds were consuming, angling would be allowed.

Waterfowl hunting would be allowed consistent with the protection of other avian resources. This would not be substantially different than the conditions that currently exist, and would be better than what would occur in the future under the No Action Alternative.

The water diversion and pipeline and sedimentation basin would be located in an agricultural area and would not affect recreational opportunities.

Overall, impacts on recreational resources would be beneficial compared to the existing environmental setting, and benefits would be even greater in comparison to the No Action Alternative.

3.18.3.5 Alternative 2 – New River, Pumped Diversion

Impact REC-1: The SCH Project would create recreational opportunities at the pond sites (beneficial impact). The discussion under Alternative 1 is applicable to this alternative.

3.18.3.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact REC-1: The SCH Project would create recreational opportunities at the pond sites (beneficial impact). The discussion under Alternative 1 is applicable to this alternative.

3.18.3.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact REC-1: The SCH Project would create recreational opportunities at the pond sites (beneficial impact). The discussion under Alternatives 1 is applicable to this alternative. Waterfowl blinds currently at Morton Bay would be included in area where the ponds would be located; however, they would no longer be functional by the time construction occurred because the Salton Sea would have receded to an extent that waterfowl hunting would no longer be viable at this location.

3.18.3.8 Alternative 5 – Alamo River, Pumped Diversion

Impact REC-1: The SCH Project would create recreational opportunities at the pond sites (beneficial impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

3.18.3.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact REC-1: The SCH Project would create recreational opportunities at the pond sites (beneficial impact). The discussions under Alternatives 1 and 4 are applicable to this alternative.

3.18.4 References

California Department of Water Resources (DWR) and California Department of Fish and Game (DFG). 2007. Salton Sea Ecosystem Restoration Program Final Programmatic Environmental Impact Report.

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3.19 SOCIOECONOMICS

This section discusses regional employment and revenue associated with Project-related expenditures, agricultural resources, and recreational activities. Demographics (income and racial composition) are discussed in Section 3.7, Environmental Justice, and total population and housing are discussed in Section 3.16, Population and Housing. All of the Project alternatives are located entirely within Imperial County, and this is where the majority of expenditures associated with the SCH Project are expected to occur. Thus, the study area is Imperial County and, more specifically, the communities within the immediate vicinity of the southern Salton Sea in Imperial County, including the cities of Westmorland, Calipatria, and Brawley, and the unincorporated communities of Niland and Salton City.

Table 3.19-1 summarizes the socioeconomic impacts of each of the six Project alternatives compared to both the existing conditions and the No Action Alternative.

Table 3.19-1 Summary of Impacts on Socioeconomics

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact SOC-1: Project construction and operations would cause an increase in local employment.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact SOC-2: Project construction and operations would result in an increase in tax revenue and local business revenue due to worker income and spending and materials purchases.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact SOC-3: Project operation would increase opportunities for passive recreational activity and research at the SCH ponds.	Existing Condition	B	B	B	B	B	B	None required
	No Action	B	B	B	B	B	B	None required
Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use.	Existing Condition	L	O	L	O	L	L	None required
	No Action	L	O	L	O	L	L	None required
Impact SOC-5: The SCH Project would result in the temporary loss of agricultural revenue due to construction and maintenance activities in the water pipeline right-of-way.	Existing Condition	L	O	O	L	O	O	None required
	No Action	L	O	O	L	O	O	None required
Impact SOC-6: Pipeline construction would require the temporary disruption of agricultural drains and canals.	Existing Condition	L	O	O	L	O	O	None required
	No Action	L	O	O	L	O	O	None required
Impact SOC-7: The SCH Project would restore a portion of lost habitat for some birds that are attracted to agricultural fields.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Table 3.19-1 Summary of Impacts on Socioeconomics
Note: O = No Impact L = Less than Significant Impact S = Significant Impact, but Mitigable to Less than Significant U = Significant Unavoidable Impact B = Beneficial Impact

3.19.1 Regulatory Requirements

3.19.1.1 National Environmental Policy Act and California Environmental Quality Act

Under the National Environmental Policy Act (NEPA), economic and social effects are not intended by themselves to require the preparation of an Environmental Impact Statement (EIS), but an EIS must include a discussion of a project's economic and social effects when these effects are related to effects on the natural or physical environments (40 Code of Federal Regulations [CFR] section1508.14). Similarly, under the California Environmental Quality Act (CEQA) Guidelines, economic or social information may be included in an Environmental Impact Report (EIR), or may be presented in whatever form the agency desires. Economic or social effects of a project are not to be treated as significant effects on the environment, and those that are not related to physical impacts are not required to be evaluated in an EIR, although these effects may be taken into account when determining the significance of physical changes caused by a project (CEQA Guidelines, section 15131).

3.19.1.2 Commodity Specific Food Safety Guidelines for the Production and Harvest of Lettuce and Leafy Greens

The Commodity Specific Food Safety Guidelines for the Production and Harvest of Lettuce and Leafy Greens were established on August 4, 2010 and outline the food safety practices that the California Leafy Green Products Handler Marketing Agreement (LGMA) members are required to implement. The LGMA operates with oversight from the California Department of Food and Agriculture as a mechanism for verifying that farmers follow food safety practices for lettuce, spinach, and other leafy green vegetables, such as arugula, chard, escarole, cabbage, endive, kale, and spring mix. Most, if not all, of the agricultural distributors in the Project vicinity are members of the LGMA. The food safety guidelines focus on minimizing microbial food safety hazards by providing suggested actions to reduce, control, or eliminate microbial contamination of lettuce/leafy greens in the field. Animals of significant risk for contaminating crops are wild pigs, deer, cattle, sheep, and goats because their feces are identifiable and are known carriers of pathogens. Birds are not explicitly covered under the guidelines, although they also may carry pathogens. Typically, if any feces (including bird feces) are found in a field, that area is flagged off, deemed contaminated, and remedial actions are taken, which may include eliminating the affected portion of the crop (personal communication, M. Villaneva 2010).

3.19.1.3 Imperial County General Plan

The Imperial County General Plan (County of Imperial 2008) includes several goals and objectives that support diversified economic development in the county while preserving agricultural activity.

3.19.2 Affected Environment

The Salton Sea serves two important functions for the economy of Imperial County. First, it is a recreational resource that attracts visitors from other areas of Southern California and the greater United States. It therefore generates tourist-based income and employment for the surrounding communities. Second, it serves as the repository for stormwater and agricultural runoff from Imperial Valley, and thus

represents an essential infrastructure for the local economy (California Department of Water Resources [DWR] and California Department of Fish and Game [DFG] 2007).

The data presented in the following subsections are based upon the most recent estimates from the California Employment Development Department (EDD) and the U.S. Bureau of Economic Analysis (USBEA).

3.19.2.1 Employment

Total population in Imperial County grew approximately 17 percent between 2001 and 2008. As shown in Table 3.19-2, which presents the distribution of employment by industry in the county and the percent of change in employment between 2001 and 2008, job growth in Imperial County matched the rate of population growth in the same time period. However, the distribution of jobs within the sectors shifted, with more new jobs being created in manufacturing and service-oriented sectors. The sectors with the greatest number of jobs remained services, state and local government, and wholesale and retail trade. All sectors experienced growth between 2001 and 2008, with the exception of farming, which declined by about 40 percent. Although arts, entertainment, and recreation and accommodation and food services together accounted for only 6 percent of total employment in the county, both of these sectors grew at a greater rate than total employment in the county during the same time period, with arts, entertainment, and recreation experiencing the greatest increase (77 percent) of any sector (USBEA 2010).

Table 3.19-2 Employment by Industry in Imperial County

Industry	2001	2008	Percent Change
Farm	5,487	3,317	-39.5
Utilities	275	440	60.0
Construction	2,172	2,231	2.7
Manufacturing	1,836	2,678	45.9
Trade (wholesale & retail)	9,786	11,515	17.7
Transportation and warehousing	2,437	2,443	0.2
Arts, entertainment, and recreation	226	401	77.4
Accommodation and food services	3,018	3,754	24.4
Other services	13,140	17,897	36.2
Federal government (civilian and military)	2,224	2,777	24.9
State and local government	13,349	15,304	14.6
Total Number of Jobs	60,515	70,817	17.0

Source: USBEA 2010

According to the Imperial County General Plan Land Use Element and studies conducted by the Imperial Valley Association of Governments (IVAG), the decline in employment in the farming sector may be explained by a shift in the local economy, which is becoming more diversified and less reliant on the

seasonal cycles of agriculture. However, while jobs in the farming industry appear to have been decreasing, it is estimated that total employment in this industry is supplemented by as many as 15,000 workers from Mexico annually (Imperial County 2008, IVAG 2006). Major employers in the vicinity of the SCH Project include two state prisons (Centinela State Prison and Calipatria Prison); Pioneer Memorial Hospital and Spreckels Sugar Company, both in Brawley; and Zinn Packing Company in Calipatria (EDD 2010a).

3.19.2.2 Unemployment

The Imperial County unemployment rate in August 2010 was 29.2 percent, the highest of any county in California. The annual average unemployment rate in Imperial County in 2009 was 28.2 percent. This was more than double the unemployment rate in the state of California (11.4 percent) at the time. Unemployment rates in the cities nearest the SCH Project sites – Calipatria, Brawley, and Westmorland – were greater than both the county and state rates (29.8, 30.9, and 39.3 percent, respectively). Unemployment rates in the larger cities within the county – El Centro and Calexico – were 26.8 and 31.2, respectively. Unemployment rates in the county remained consistently at approximately 15 percent between 2000 and 2003 and began to rise in 2004, with the greatest change in unemployment in one year between 2008 and 2009 (22.4 percent to 28.2 percent) (EDD 2010b).

3.19.2.3 Recreation-Related Revenue

The travel industry is a major component of California's economy and a primary industry for many local communities. In 2004, every $100 of travel spending generated $32.13 of earnings, $2.33 of local tax revenue, and $3.97 of state tax revenue. Tax receipts collected by counties and municipalities, as levied on applicable travel-related purchases, include local sales taxes and transient occupancy taxes (DWR 2005).

Within Imperial County, the Salton Sea is a major travel destination, recreational resource, and source of revenue for the county as a whole and for the nearby communities. In 2005, DWR conducted a recreation and economics opportunities assessment that focused on recreation and tourism spending in the vicinity of the Salton Sea (DWR 2005). In 2003, the total direct travel spending in Imperial County was $250.4 million. The local tax receipts generated by travel spending in Imperial County totaled $4.3 million. The assessment did not estimate the number of visitors to local and county recreational areas associated with the Salton Sea; however, it was estimated that during the 2003/2004 fiscal year, the Salton Sea State Recreational Area received approximately 227,500 visitors and that an estimated 45,000 vehicles entered the Sonny Bono Salton Sea National Wildlife Refuge. On average, visitors to the Salton Sea State Recreational Area spent $92.50 per visitor per day.

3.19.2.4 Agriculture-Related Revenue

Imperial County produces more than 100 different commodities, including livestock, apiary products, and a wide variety of field and other crops. Table 3.19-3 summarizes the acreage devoted to the general categories of crops grown in the Imperial Valley in 2000, 2005, and 2009. The acreage dedicated to each type of crop, as well as the total acreage in cultivation, may change over time in response to market conditions and other factors.

Table 3.19-3 Change in Cropping Patterns, 2000-2009			
Commodity	2000 (acres)	2005 (acres)	2009 (acres)
Field crops	389,628	351,866	353,128
Vegetable and melon crops	103,550	100,052	114,099
Fruit and nut crops	5,959	6,341	6,745
Seed and nursery products	81,564	55,711	62,237
Total acres	580,701	513,970	536,209
Source: County of Imperial Agricultural Commissioner 2001, 2006, and 2010			

The total gross agricultural production 2009 value in Imperial County was $1,452,970,000, an overall reduction of 13.75 percent over the preceding year. This reduction was due primarily to decreased prices. Field crops and seed and nursery crops had losses of over 35 percent, while livestock decreased by about 14 percent, and apiary products and vegetable and melon crops remained relatively stable. Fruit and nut crops increased by nearly 28 percent (County of Imperial Agricultural Commissioner 2011). As shown in Table 3.19-4, the relative economic importance of the current top ten agricultural commodities may change from year to year, although cattle are consistently ranked number one.

Table 3.19-4 Top Ten Commodities in Imperial County in 2009 and Rankings over Time				
Commodity	2009 Value (dollars)	2009 Ranking	2005 Ranking	2000 Ranking
Cattle	287,001,000	1	1	1
Head lettuce	146,697,000	2	5	3
Leaf lettuce	115,916,000	3	3	7
Wheat	97,862,000	4	20	13
Alfalfa	85,344,000	5	2	2
Broccoli	79,466,000	6	7	8
Carrots	54,643,000	7	4	4
Onions	45,278,000	8	8	10
Sugar beets	41,764,000	9	9	5
Spring mix	37,193,000	10	21	34
Source: County of Imperial Agricultural Commissioner 2001, 2006, and 2010				

3.19.3 Impacts and Mitigation Measures

3.19.3.1 Impact Analysis Methodology

Each of the Project alternatives was compared to the existing environmental setting described above and the No Action Alternative to determine the comparative magnitude of impacts on socioeconomic resources within the study area.

It was assumed that the majority of construction workers would come from the local area, with the exception of heavy equipment operators. Heavy equipment would likely be brought in from the San Diego area, and some specialized equipment, such as clamshell derricks, tractor scraper units, and excavators, could come from either the San Francisco Bay Area or the Sacramento area. The socioeconomic impacts associated with the temporary relocation of this heavy equipment and an estimated total of 18 to 60 heavy equipment operators would be negligible within such large population centers and would not result in any physical effects on the environment; thus, impacts in those areas are not discussed further.

3.19.3.2 Thresholds of Significance

Significance Criteria

Socioeconomic impacts would be significant if the Project alternatives would:

- Substantially decrease local employment;
- Substantially decrease revenue for local businesses;
- Substantially decrease revenue for agricultural enterprises; or
- Substantially decrease public agency revenue.

Application of Significance Criteria

The following summarizes the overall methodology used in applying the significance criteria to the Project alternatives:

- **Substantially decrease local employment** – An alternative would substantially decrease local employment if the Project resulted in the closure of local businesses or industry.
- **Substantially decrease revenue for local businesses** – An alternative would substantially decrease revenue for local businesses if it deterred visitors and potential customers from visiting the Salton Sea in the vicinity of the SCH Project;
- **Substantially decrease revenue for agricultural enterprises** – An alternative would substantially decrease revenue for agricultural enterprises if it substantially reduced the land available for future agricultural reclamation as compared to the total land area available or converted existing agricultural land to non-agricultural uses without appropriate compensation to the farmer. An alternative would also substantially decrease revenue for agricultural enterprises if the Project resulted in a substantial increase in the types of birds in the vicinity of the ponds that were likely to damage crops through depredation or exposure to fecal matter, potentially requiring the destruction of the affected area.
- **Substantially decrease public agency revenue** – An alternative would substantially decrease public agency revenue if it resulted in a decrease in tax revenue as a result of decreased revenue for local businesses (e.g., less sales tax revenue), decreased local employment (e.g., less income tax revenue), or reduced recreation-based income (e.g., entrance fees, fishing licenses) in the study area.

3.19.3.3 No Action Alternative

In 2012 when Project construction is expected to begin, socioeconomic conditions would likely be substantially similar to those described under the Affected Environment above, although some normal fluctuations would be expected.

Declining inflows in future years from various factors will result in collapse of the Salton Sea ecosystem due to increasing salinity and other water quality issues, such as temperature, eutrophication and related anoxia, and algal productivity. The loss of fish populations from the open water area will significantly reduce, and possibly eliminate, use of the Salton Sea by fish-eating birds, such as pelicans, double-crested cormorants, and black skimmers by the early 2020s. Some of these birds could use the areas where the rivers, creeks, and drains enter the Salton Sea if fish continue to persist in these locations. In addition, the relative abundance of bird species that forage on invertebrates likely will change over time with increases in salinity and resultant changes in the invertebrate community.

The reduction of bird populations would reduce the potential for crop depredation and the exposure of lettuce and other leafy green vegetables to fecal matter, which would benefit agriculture by reducing the potential for loss of crops.

Until 2018, surface water elevations in the Salton Sea would decline due to factors unrelated to the QSA from the existing elevation of about -228 feet mean sea level (msl) to -235 feet msl. After 2018, when mitigation water is no longer conveyed to the Salton Sea, inflows and the surface water elevation would decline rapidly. By 2078, the elevation would be about -260 feet msl. The surface water area would decline from the existing 230,000 acres to 213,000 acres in 2018 and 140,000 acres by 2078. The amount of exposed playa that would result over time is as follows (DWR and DFG 2007):

Up to 2020	4,000 acres
2020 – 2030	36,000 acres
2030 – 2078	48,000 acres

As the Salton Sea recedes, there is a potential that farmers could reclaim the exposed land for agricultural uses, but the likelihood of this occurring is speculative. The land near the river deltas would be composed primarily of sand, silt, and fine particles and would be suitable for agriculture, but it would require reclamation. Reclamation would involve leaching the salts out of the soils through the application of water, and the ground would need to be 6 to 7 feet higher than any standing or running water in the area. Groundwater intrusion could also be an issue, requiring a good drainage system to prevent the upward movement of salty water. Water also would need to be made available by the Imperial Irrigation District for irrigation (personal communication, K. Bali 2010). Thus, the likelihood of this land being reclaimed in the future is possible, but is considered speculative at this time.

Reduced water quality and fisheries production would likely result in a decrease in recreational activities, which would over time decrease or eliminate revenue for local businesses that cater to recreational resources such as marinas, bait shops, and other outfitters. Similarly, a reduction in recreational activity would correspond with reduced recreation-based public agency revenue, both in the total amount of entrance fees collected at state facilities and in the amount of fishing and boating licenses sold in the vicinity of the Salton Sea.

3.19.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact). Project construction would generate a temporary increase in the demand for construction workers and truck drivers. As shown in Table 3.19-2, a pool of nearly 4,700 construction and transportation workers is available in Imperial County to help meet the needs of the Project, which include 2 managers, 3 foremen, 50 truck drivers, 6 laborers, and 36 heavy equipment operators, for a total of 97 workers over the approximately two-year construction period (as noted above the heavy equipment operators likely would come from San Diego, San Francisco, or Sacramento). Since the majority of the population in Imperial County is concentrated in the cities near the United States-Mexican border (see Section 3.16, Population and Housing), more construction workers could be drawn from these areas to work on the Project rather than the communities in the immediate vicinity. Employment impacts from Project construction would be beneficial compared to both the current environmental setting and the No Action Alternative.

Minimal staff would be required during operation and maintenance; this requirement would be a minor, although beneficial, impact compared to both the current environmental setting and the No Action Alternative.

Impact SOC-2: Project construction and operations would result in an increase in tax revenue and local business revenue due to worker income and spending and materials purchases (beneficial impact). As discussed in Section 3.16, Population and Housing, the majority of the population in Imperial County is concentrated in the cities near the United States-Mexican border, and the populations of cities and communities in the vicinity of Project are much smaller. Materials purchases therefore are more likely to occur in these cities than communities nearer the construction site. Since heavy equipment operators would likely come from San Diego, Sacramento, and San Francisco, some temporary housing would be required in the nearby local communities, most likely Westmorland or Calipatria, or at nearby campgrounds. This would generate an increase in local business revenue and associated lodging taxes. Other construction worker spending in the vicinity of the Project would be minimal (e.g., meals, personal necessities, etc.) but beneficial compared to both the current environmental setting and the No Action Alternative.

Certain construction materials, such as rip-rap, also would likely be purchased in Imperial County, which also would have a beneficial economic impact.

As noted above, minimal staff would be required during operation and maintenance of the SCH Project, which would result in a small increase in tax revenue and local business revenue. This would be a minor, although beneficial impact in comparison to both the existing setting and the No Action Alternative, as would the purchase of materials required for operations and maintenance.

Impact SOC-3: Project operation would increase opportunities for passive recreational activity and research at the SCH ponds (beneficial impact). Under this alternative, the newly restored habitat would provide opportunities for passive recreational activities, such as day use, hiking, bird watching, photography, and non-motorized watercraft use, subject to seasonal restrictions to protect nesting birds. Angling may also be allowed if fish populations become well established. Waterfowl hunting may be allowed as well, to the extent that such species use the ponds.

Bird watching and wildlife-related photography historically have been some of the most popular activities at the Salton Sea. The 2005 DWR study of recreation at the Salton Sea estimated that on average visitors to the Salton Sea Recreation Area spent $92.50 per person per day, excluding travel expenses in 2003. The capacity of facilities for bird-watching and photography at the National Wildlife Refuge lands along

the Salton Sea was 6,000 visitors per year in 2004 (DWR 2005). As discussed above, every $100 of travel spending generates approximately $32.13 of earnings, $2.33 of local tax revenue, and $3.97 of state tax revenue. Although the expected number of visitors to the restoration area is unknown, if the Project increased the capacity for these recreational activities, additional passive recreational users could be attracted to the project vicinity and visitor spending in the vicinity of the SCH Project would likewise increase. Impacts would therefore be beneficial compared to the current environmental setting because it is likely that more visitors would be attracted than currently use the area, which is in a remote agricultural setting with limited opportunities for passive recreational activities. The Project also would have a long-term beneficial impact when compared to the No Action Alternative because it would be one of the few remaining areas at the Salton Sea where birds and fish were present.

Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use (less-than-significant impact). Once the SCH ponds were created, the underlying playa would no longer be available for reclamation as agricultural land. The amount of exposed playa that is expected to be present over time is shown in Table 3.19-5, along with the percentage that would be removed through implementation of Alternative 1, which would restore approximately 3,130 acres of habitat.

Table 3.19-5 Percentage of Exposed Playa Covered as a Result of Alternative 1 Implementation

Time Period	Exposed Playa (without SCH)	Percentage Lost with Alternative 1
Up to 2020	4,000 acres	78
2020 – 2030	36,000 acres	9
2030 – 2078	48,000	6
Source: DWR and DFG 2007, Table H7-2		

As the Salton Sea recedes over time, implementation of Alternative 1 would comprise a smaller percentage of the exposed playa. In 2020, when approximately 4,000 acres of playa would be exposed, Alternative 1 ponds would comprise 78 percent of this area. By 2030, the Alternative 1 ponds would represent only 9 percent of the exposed area, and by 2078, this would be further reduced to 6 percent. Given the small percentage of the land area that would be occupied by the SCH Project and the uncertainty regarding whether any of the exposed land would be reclaimed for agricultural purposes, this impact is considered less than significant compared to both the current environmental setting and the No Action Alternative.

Impact SOC-5: The SCH Project would result in the temporary loss of agricultural revenue due to construction and maintenance activities in the water pipeline right-of-way (less-than-significant impact). Construction would require a 220-foot right-of-way during pipeline installation, and a right-of-way also would be needed to during operations in order to allow access for maintenance, although the corridor may be smaller. This impact would occur regardless of whether the pipeline followed an existing roadway or crossed agricultural fields, although it would be somewhat less if the roads were followed. The land right-of-way would be obtained from a willing owner who would be compensated for the temporary loss of the use of this land. Once the pipeline was installed, crops could be grown in the right-of-way. There could be temporary disruptions in agricultural uses if the pipeline needed to be maintained, but this would be factored into the compensation provided to the landowner. Impacts would be less than significant because landowners would be adequately compensated for the temporary loss of revenue from their land.

Impact SOC-6: Pipeline construction would require the temporary disruption of agricultural drains and canals (less-than-significant impact). As shown on Figure 3-11-6, a number of agricultural drains are present in the vicinity of the area where the pipeline would be located, and a number of canals are present along roads. Installation of the pipeline would require crossing a number of these drains regardless of whether the route followed existing roads or crossed agricultural fields, and construction along roads would likely affect canals. Each drain would be cut and a bypass would be would be put in place to ensure that the water did not back up into agricultural fields; similarly, bypasses would be established for canals. The drains and canals would be restored to their original condition and reconnected once pipeline installation was completed. There is a potential for disruption of drains and canals if excavation of the pipeline is required for maintenance, and the same procedures would be followed as during construction. As noted above, land would be acquired from willing owners who would be adequately compensated for any loss of their land during construction and operations/maintenance. This impact would therefore be less than significant.

Impact SOC-7: The SCH Project would restore a portion of lost habitat for some birds that are attracted to agricultural fields (less-than-significant impact). As discussed in Section 3.4, Biological Resources, the salinity of the Salton Sea is projected to continue to increase and the water surface elevation will continue to decrease. This trend will accelerate after 2017, when IID stops providing mitigation water to the Sea. The decline and ultimate loss of open water fish populations, and particularly tilapia, is expected to reduce and possibly eliminate use of the Salton Sea by fish-eating birds such as pelicans, double-crested cormorants, and black skimmers by the early 2020s. Some of these birds could use areas where the rivers, creeks, and drains enter the Sea if fish continue to persist in these locations, as well as the sedimentation/distribution basins. The SCH Project would compensate for a portion of the lost habitat, but it would not create new habitat in a place where it does not currently exist, nor would it create more habitat than is present at the southern end of the Salton Sea at present. The precise number of birds that would use the habitat is not known at this point, but overall, the number of birds that are present in the general vicinity will decrease over time regardless of whether the Project is implemented.

The SCH Project is being designed to provide habitat for fish-eating birds that are dependent on the Salton Sea: American white pelican, black skimmer, Caspian tern, double-crested cormorant, and gull-billed tern. These birds would not forage in the nearby fields. The ponds would attract other bird species, as well, however. The bird species that currently use the nearby agricultural fields are described below, followed by a discussion of whether these species are expected to use the SCH ponds.

Snow geese, Ross' geese and American wigeon forage in the agricultural fields, particularly lettuce and alfalfa (personal communication, A. Kalin 2011). They may roost or loaf in the proposed SCH ponds, but this would not be different than the existing condition. Based on the expected high salinity of the ponds and the lack of emergent vegetation, these species are not expected to forage in the proposed SCH ponds, nor would the ponds provide nesting habitat for these species, which otherwise could result in a larger population.

Blackbirds, starlings, cowbirds, grackles, and horned larks feed in newly planted fields on germinating seeds of various crops planted (personal communication, A. Kalin 2011). These species are not expected to use the SCH ponds.

White-faced ibis, cattle egrets, and curlews feed on insects in farmers' bermudagrass and alfalfa fields while the fields are being irrigated and for a few days after the irrigation. These types of birds are actually a benefit to the farmers in that they consume the majority of crickets, cutworms, and armyworms pushed to the surface by the irrigation in the portions of each field irrigated during daylight hours (personal communication, A. Kalin 2011). These species are expected to do some foraging at the SCH ponds, but continue to do most of their foraging in the agricultural fields.

Gulls, particularly the ring-billed gull and California gull, feed in farmers' fields during irrigation as well as during the lettuce harvest (personal communication, A. Kalin 2011). Gulls are expected to roost at the SCH ponds, and because fish would be present, they would also be likely to forage there. Because the ponds would provide a food source, they may keep gulls away from the fields. The SCH Project would not be designed to encourage the presence of gulls.

Sandhill crane numbers are increasing around the southern edge of the Salton Sea and may feed on grains and seeds. It is possible that they may roost in the proposed SCH ponds (but not at the sedimentation basins, which would be too deep), but they are not expected to forage at the ponds. The ponds would not provide nesting habitat for the cranes and are not expected to increase overall populations compared to existing conditions.

There is a potential for some birds that use the SCH ponds to forage in the nearby fields and expose crops to bird feces. Of the species that are attracted to the agricultural fields, however, only gulls are anticipated to be potentially high users of the SCH ponds. It is possible that after the collapse of the Salton Sea, SCH ponds could locally increase the density of gulls, at least temporarily. However, as noted above, overall available habitat will be declining, thereby resulting in an overall decline of bird populations. Further, the species that most frequently use the agricultural fields are attracted to the irrigated fields, not to the Sea itself. The SCH ponds are being created to partially replace the Salton Sea habitat, so the type of habitat created by the SCH ponds is not the type of habitat that is most attractive to these species. Impacts would be less than significant when compared to both the existing environmental conditions and the No Action Alternative.

3.19.3.5 Alternative 2 – New River, Pumped Diversion

Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although 77 workers would be required (of which approximately 27 would relocate from the outside area); thus, the economic benefit would be slightly less than under Alternative 1.

Impact SOC-2: Project construction and operations would result in an increase in tax revenue and local business revenue due to worker income and spending and materials purchases (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although only 77 workers would be required; thus, the economic benefit would be slightly less than under Alternative 1.

Impact SOC-3: Project operation would increase opportunities for passive recreational activity and research due to increased bird nesting and foraging in the Salton Sea (beneficial impact). The discussion under Alternative 1 is applicable to this alternative.

Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although less habitat would be restored (2,670 acres as opposed to 3,130 acres). Therefore, the amount of exposed playa that would be converted to habitat would be less, as shown in Table 3.9-6.

Table 3.19-6 Percentage of Exposed Playa Covered as a Result of Alternative 2 Implementation

Time Period	Exposed Playa (without SCH)	Percentage Lost with Alternative 2
Up to 2020	4,000 acres	67
2020 – 2030	36,000 acres	7
2030 – 2078	48,000 acres	6
Source: DWR and DFG 2007, Table H7-2		

Impact SOC-7: The SCH Project would restore a portion of lost habitat for some birds that are attracted to agricultural fields (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.19.3.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although 115 workers would be required (of which approximately 44 would relocate from the outside area); thus, the economic benefit would be slightly greater than under Alternative 1.

Impact SOC-2: Project construction and operations would result in an increase in tax revenue and local business revenue due to worker income and spending and materials purchases (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although 115 workers would be required; thus, the economic benefit would be slightly greater than under Alternative 1.

Impact SOC-3: Project operation would increase opportunities for passive recreational activity and research at the SCH ponds (beneficial impact). The discussion under Alternative 1 is applicable to this alternative.

Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although more habitat would be restored (3,770 acres as opposed to 3,130) (refer to Table 3.19-7 for the percentage of exposed playa that would be covered with water.

Table 3.19-7 Percentage of Exposed Playa Covered as a Result of Alternative 3 Implementation

Time Period	Exposed Playa (without SCH)	Percentage Lost with Alternative 4
Up to 2020	4,000 acres	94
2020 – 2030	36,000 acres	10
2030 – 2078	48,000 acres	8
Source: DWR and DFG 2007, Table H7-2		

Impact SOC-7: The SCH Project would restore a portion of lost habitat for some birds that are attracted to agricultural fields (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.19.3.7 Alternative 4 – New River, Gravity Diversion + Cascading Pond

Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although only 47 workers would be required (of which approximately 17 would relocate from the outside area); thus, the economic benefit would be slightly less than under Alternative 1.

Impact SOC-2: Project construction and operations would result in an increase in tax revenue and local business revenue due to worker income and spending and materials purchases (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although only 47 workers would be required; thus, the economic benefit would be slightly less than under Alternative 1.

Impact SOC-3: Project operation would increase opportunities for passive recreational activity and research at the SCH ponds (beneficial impact). The discussion under Alternative 1 is applicable to this alternative.

Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although a greater amount of habitat would be restored (2,290 acres as opposed to 3,130). Therefore, the amount of exposed playa that would be converted to habitat is greater, as shown in Table 3.9-8, but the significance of the impact would not change because the percentage is ultimately small, and the potential for the land to be reclaimed is speculative at this time.

Table 3.19-8 Percentage of Exposed Playa Covered as a Result of Alternative 4 Implementation

Time Period	Exposed Playa (without SCH)	Percentage Lost with Alternative 4
Up to 2020	4,000 acres	57
2020 – 2030	36,000 acres	6
2030 – 2078	48,000 acres	5
Source: DWR and DFG 2007, Table H7-2		

Impact SOC-5: The SCH Project would result in the temporary loss of agricultural revenue due to construction and maintenance activities in the water pipeline right-of-way (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact SOC-6: Pipeline construction would require the temporary disruption of agricultural drains and canals (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact SOC-7: The SCH Project would restore a portion of lost habitat for some birds that are attracted to agricultural fields (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.19.3.8 Alternative 5 – Alamo River, Pumped Diversion

Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although only approximately 43 construction workers would be required (of which approximately 15 are expected to relocate from the outside area); thus, the economic benefit would be less than under Alternative 1.

Impact SOC-2: Project construction and operations would result in an increase in tax revenue and local business revenue due to worker income and spending and materials purchases (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although only 43 workers would be required. Thus, the economic benefit would be less than under Alternative 1.

Impact SOC-3: Project operation would increase opportunities for passive recreational activity and research at the SCH ponds (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, but less habitat would be restored.

Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although less habitat would be restored (2,080 acres as opposed to 3,130 acres). Therefore, the amount of exposed playa that would be converted to habitat is less, as shown in Table 3.9-9.

Table 3.19-9 Percentage of Exposed Playa Covered as a Result of Alternative 5 Implementation

Time Period	Exposed Playa (without SCH)	Percentage Lost with Alternative 5
Up to 2020	4,000 acres	52
2020 – 2030	36,000 acres	6
2030 – 2078	48,000 acres	4
Source: DWR and DFG 2007, Table H7-2		

Impact SOC-7: The SCH Project would restore a portion of lost habitat for some birds that are attracted to agricultural fields (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.19.3.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact SOC-1: Project construction and operations would cause an increase in local employment (beneficial impact). The discussion under Alternative 1 is applicable to this alternative; although only approximately 58 construction workers would be required (of which approximately 24 would relocate from the outside area) during the two-year construction period; thus, the economic benefit would be less than under Alternative 1.

Impact SOC-2: Project construction and operations would result in an increase in tax revenue and local business revenue due to worker income and spending and materials purchases (beneficial impact). The discussion under Alternative 1 is applicable to this alternative, although only 58 construction workers would be required. Thus, the economic benefit would be less than under Alternative 1.

Impact SOC-3: Project operation would increase opportunities for passive recreational activity and research at the SCH ponds (beneficial impact). The discussion under Alternative 1 is applicable to this alternative.

Impact SOC-4: Pond creation would preclude the reclamation of exposed playa for agricultural use (less-than-significant impact). The discussion under Alternative 1 is generally applicable to this alternative, although less habitat would be restored (2,940 acres as opposed to 3,130 acres). Therefore, the amount of exposed playa that would be converted to habitat is less, as shown in Table 3.9-10.

Table 3.19-10 Percentage of Exposed Playa Covered as a Result of Alternative 6 Implementation

Time Period	Exposed Playa (without SCH)	Percentage Lost with Alternative 6
Up to 2020	4,000 acres	73
2020 – 2030	36,000 acres	8
2030 – 2078	48,000 acres	6
Source: DWR and DFG 2007, Table H7-2		

Impact SOC-7: The SCH Project would restore a portion of lost habitat for some birds that are attracted to agricultural fields (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.19.4 References

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3.20 TRANSPORTATION AND TRAFFIC

This section addresses increased vehicular traffic during construction, operations, and maintenance from the transport of people, equipment, and materials to and from the Species Conservation Habitat (SCH) Project sites. It also considers the potential for the Project to cause conflicts with other uses, such as farm equipment, and affect emergency access. The potential for bird airstrikes, which could affect air traffic, is addressed in Section 3.10, Hazards and Hazardous Materials.

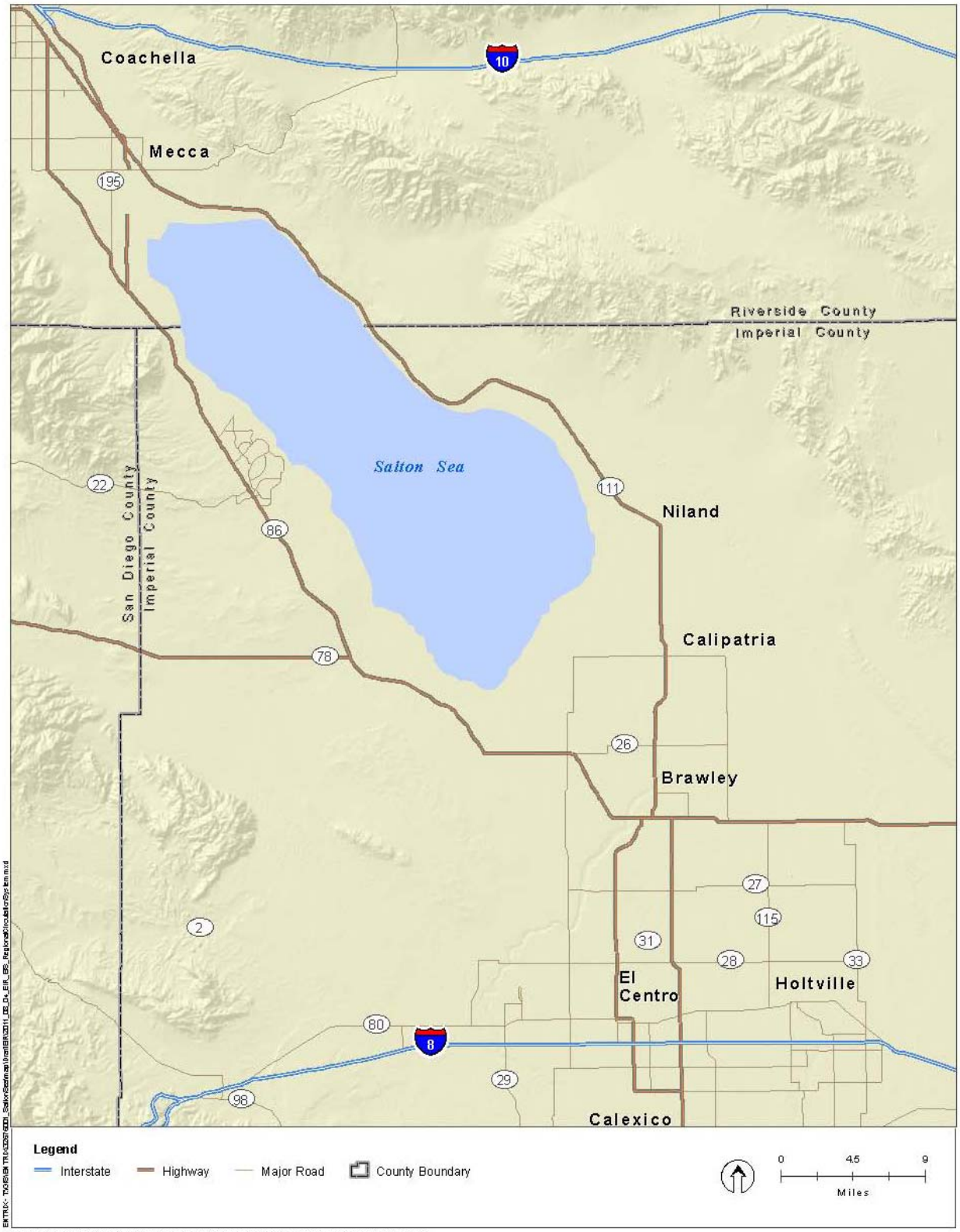
The study area for transportation and traffic focuses on the roads that would be used to access the Project sites. Regional access to the Project area is provided by Interstates (I-) 8 and 10 and State Highways (State Routes [SR-]) 78, 86, and 111, as shown in Figure 3.20-1, Regional Circulation System.

Table 3.20-1 summarizes the impacts of the six SCH Project alternatives on traffic and transportation compared to both the existing conditions and the No Action Alternative.

Table 3.20-1 Summary of Impacts on Transportation and Traffic

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact TRAN-1: The SCH Project would increase traffic during construction and operations, but would not reduce the level of service of any roadways below the County of Imperial's standard (LOS C).	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact TRAN-2: Construction/maintenance equipment and tractor trailers could be present in areas used by farm equipment, but would not pose a substantial safety hazard.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact TRAN-3: Emergency vehicles would retain their ability to access the Project area during construction and operations despite increased traffic and construction near roadways.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact



Source: Aerial Imagery: U.S. Dept. of Agriculture, Natl. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.20-1 Regional Circulation System

3.20.1 Regulatory Requirements

The Federal Highway Administration and California Department of Transportation (Caltrans) establish standards and regulations for construction, operations, and maintenance of Federal and state highways, respectively. The Southern California Association of Governments and Imperial Valley Association of Governments provide regional transportation planning in the Imperial Valley, and incorporated cities provide transportation planning services for their jurisdictions.

The Circulation and Scenic Highways Element of the Imperial County General Plan (County of Imperial 2008) contains information regarding the transportation needs of the county and the various modes available to meet those needs. The Circulation Element includes information needed to coordinate regional transportation and provide for a circulation system that enables the movement of goods and people, including pedestrians, bicycles, transit, train, air, and automobile traffic flows within and through the county. Transportation resources in the county are administered by the Department of Public Works. The Circulation Element intends to guide future circulation plans such that all roads and streets will operate at Level of Service (LOS) C or better (County of Imperial 2008). Level of service is a qualitative description of a facility's performance based on average delay per vehicle, vehicle density, or volume-to-capacity ratios. Level of service ranges from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

The definitions presented in Table 3.20-2 are used in Imperial County. In addition, LOS classifications generally consider width of paved and unpaved rights-of-way, changes in speeds to accommodate cross walks and municipal speed zones (such as in Imperial County when SR-86 crosses both municipal and agricultural areas), percentage of vehicles that are trucks versus cars or agricultural vehicles (especially if no parallel routes are available), accidents per million vehicle miles on the route, and travel time and velocity. Level of service can be different along adjacent portions of a route; it can decrease to reflect additional traffic entering the roadway or increase if the roadway is widened or speed limit is increased in the adjacent portion of the route.

Table 3.20-2 Level of Service Definitions

Level of Service	Description
A	Free flow, with users unaffected by others on the roadway.
B	Stable flow, but the presence of others in the traffic stream becomes noticeable.
C	Stable flow, but users become affected by others in the traffic stream.
D	High-density but stable flow; speed and freedom of movement are severely restricted; poor level of comfort and convenience.
E	High-density, with traffic demand usually at capacity, resulting in long traffic delays.
F	Forced or breakdown flow, with traffic demand exceeding capacity; unstable stop-and-go traffic.
Source: Transportation Research Board 2000	

Roads and highways within Imperial County are grouped into the following classes or systems according to the type of service they are intended to provide:

- **Expressways** provide regional and intracounty travel services with six travel lanes.
- **Prime arterials** provide regional, subregional, and intracounty travel services with four to six travel lanes.

- **Minor arterials** provide intracounty and subregional services with four to six travel lanes.
- **Major collectors (collectors)** are designed for intracounty travel as a link between the long-haul facilities and the collector/local facilities.
- **Minor local collectors (local collectors)** are designed to connect local streets with the adjacent collectors or the arterial street system with two travel lanes.
- **Residential streets** include residential cul-de-sac and loop streets and are designed to provide direct access to abutting properties and to give access from neighborhoods to the collector street system.

Table 3.20-3 describes the relationship between level of service and average daily vehicles trips on each type of roadway.

Table 3.20-3 Imperial County Standard Street Classification and Average Daily Vehicle Trips

Road	Level of Service (LOS)				
Class	A	B	C	D	E
Expressway	30,000	42,000	60,000	70,000	80,000
Prime Arterial	22,200	37,000	44,600	50,000	57,000
Minor Arterial	14,800	24,700	29,600	33,400	37,000
Major Collector (Collector)	13,700	22,800	27,400	30,800	34,200
Minor Collector (Local Collector)	1,900	4,100	7,100	10,900	16,200
Local County (Residential)	*	*	<1,500	*	*
Local County (Residential Cul-de-Sac or Loop Street)	*	*	<200	*	*

Source: County of Imperial 2008

Note:

* Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

The County of Imperial Bicycle Master Plan (BMP) was prepared in September 2003. The BMP provides a comprehensive overview of existing bicycle routes as well as detailed plans for an improved bicycle network. Thirteen routes are proposed to improve bicycle connectivity throughout the county. Proposed Route 7 would provide access to the Salton Sea at the Sonny Bono Salton Sea National Wildlife Refuge headquarters, located at the corner of Gentry and Sinclair roads (see Figure 3.20-2). Route 7 is proposed to be constructed as a Class II route, which is a marked lane exclusively for bicycle use (County of Imperial 2003). At this time, however, no timeline exists for the implementation of the BMP, and Imperial County does not foresee any of the routes being constructed in the near future (personal communication, C. Rowin 2010).

3.20.2 Affected Environment

The vehicular transportation network in the Imperial Valley consists of freeways, highways, local roads, and rural roads. The transportation network in Imperial County is considered critical to the regional economy due to the movement of agricultural goods and services and recreational travel. The following sections describe the primary regional roadways that would be used by the SCH Project – I-8 and I-10, and SR-78, SR-86, and SR-111 – along with their traffic volumes and levels of service.

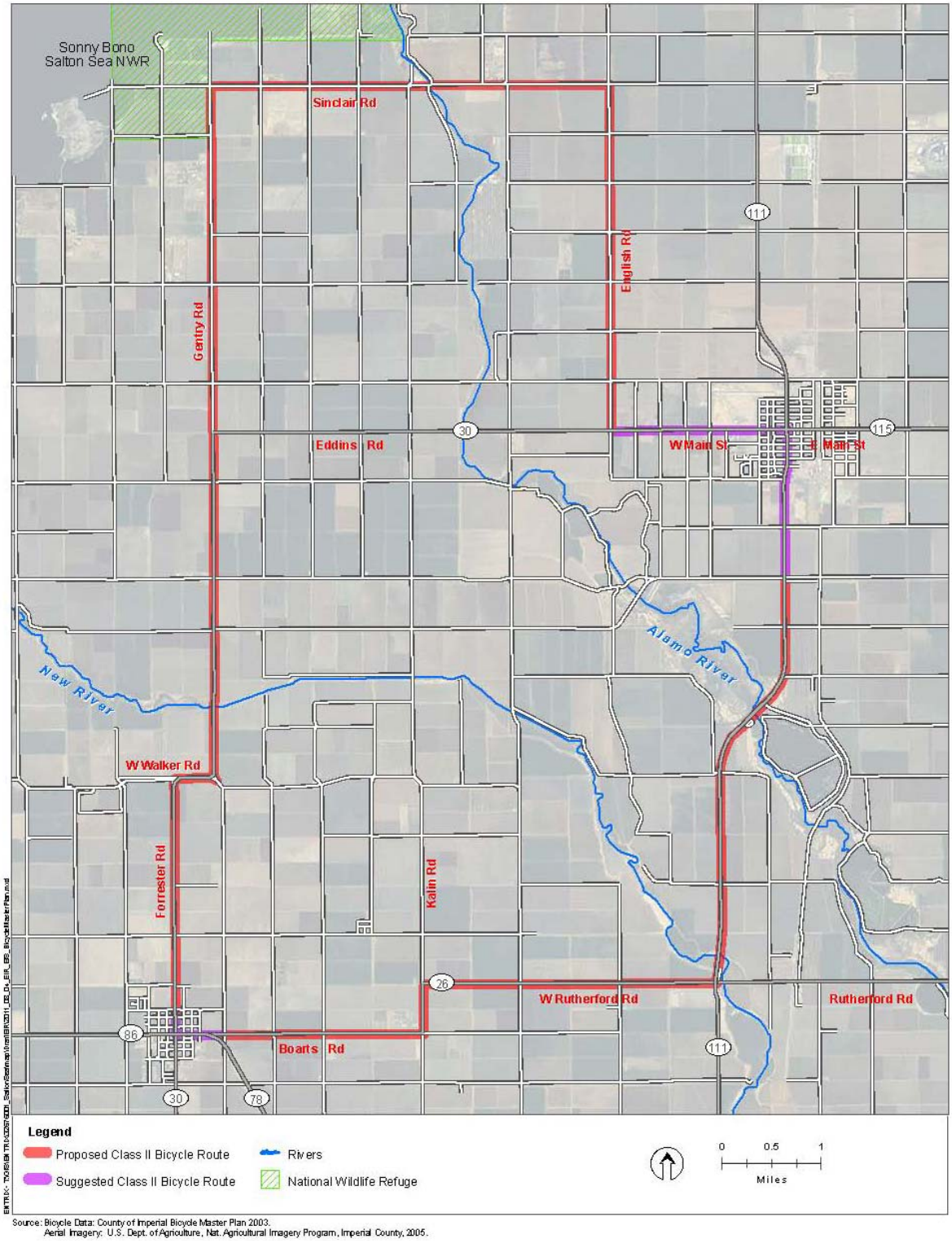
3.20.2.1 Roadways

Routes that provide regional transportation connections are described below (County of Imperial 2008):

- **I-10**, located to the north of the Salton Sea, extends in a west to east direction and provides access from the Los Angeles/Inland Empire Region to the west and Arizona to the east. I-10 is the southernmost east-west, coast-to-coast interstate highway in the United States.
- **I-8** is the primary east-west route through Imperial County between San Diego, California, and Yuma, Arizona. Providing two travel lanes in each direction, I-8 has complete grade separations at all intersections. In the Project area, I-8's main functions are to serve as an interregional route for people and goods movement, provide connection to other states, and provide access to desert recreational activities.
- **SR-86** is located to the west of the Salton Sea and extends in a north to south direction from I-10 near Indio to I-8 near El Centro. The highway begins as a four-lane expressway in Riverside County and ends as a 2-lane conventional highway at I-8. The 67.8-mile-long route primarily provides travel for interregional, intraregional, and international trips. SR-86, north of SR-78, is a major goods movement corridor serving the Los Angeles area and other California goods movement centers from the Imperial County region. During the spring, truck traffic transporting agricultural goods constitutes 35 percent of travel on this route.
- **SR-78** extends in a west to east direction from San Diego County to SR-86 near the southwestern Salton Sea shoreline. The route generally is a two-lane conventional highway throughout its alignment, although some portions recently have been upgraded to a four-lane expressway and four-lane conventional highway.
- **SR-111** extends in a north to south direction from I-10 near Indio to the United States-Mexico border at Calexico and includes a crossing of I-8 near El Centro. SR-111 is considered to be the "backbone" route of Imperial County as it connects the three largest cities (Calexico, El Centro, and Brawley) and acts as a major goods movement route, particularly for agricultural products and cross-border goods and services.

Portions of the state routes include dual classifications, such as the portion of SR-86 that is concurrent with SR-78 from Brawley to the southwestern Salton Sea shoreline.

Caltrans is currently undergoing construction of a new expressway, the Brawley Bypass. This project will include an 8-mile, four-lane divided expressway from SR-86 north of the city of Brawley to 1.5 miles south of the eastern junction of SR-111 and SR-78. Major features of this project include bridges at the New River and Union Pacific Railroad crossings, an interchange with SR-111, and accommodation for the future Brawley Airport expansion. Access to the expressway will be at about 1-mile intervals at signalized and unsignalized intersections (Caltrans 2010a). Stage 1 of the construction was completed in May 2005, stage 2 was completed in early 2011, and stage 3, which will connect SR-86 to SR-111, began in Spring 2011 and is expected to be completed in Fall 2012. A Traffic Management Plan will be operational for all stages of this project. Because the Project involves constructing a new road and not making improvement to an existing road, traffic impacts are limited. Some smaller roads within cities near SR-111 will be closed intermittently during construction of stage 3 (personal communication, S. Amen 2010).



Source: Bicycle Data: County of Imperial Bicycle Master Plan 2003.
Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.20-2 Proposed Route 7 of the County of Imperial Bicycle Master Plan

3.20.2.2 Traffic Volumes and Level of Service

Recent traffic volumes and levels of service in the study area along I-8 and I-10, and SR-78, SR-86, and SR-111 are shown in Table 3.20-4. Peak-hour traffic and annual average daily traffic (AADT) are based on peak-hour volumes published by Caltrans for the year 2009.

Table 3.20-4 Recent Traffic Volumes and LOS on Key Roadways near the Salton Sea

County	Location	Peak Hour in Peak Direction	AADT in Peak Direction	Classification (# of Lanes)	LOS
Interstate 8					
Imperial	Junction SR-98	1,850	13,800	Expressway (4)	A
Imperial	El Centro, Junction SR-86	4,000	34,500	Expressway (4)	B
Imperial	Junction SR-111	3,050	32,000	Expressway (4)	B
Imperial	Junction SR-115	1,800	12,000	Expressway (4)	A
Imperial	Junction SR-98	2,000	13,800	Expressway (4)	A
Imperial	Junction SR-186	2,900	20,400	Expressway (4)	A
Interstate 10					
Riverside	Indio, Jefferson Street/Indio Boulevard	7,500	83,000	Expressway (4)	E
Riverside	Indio, North Junction SR-111	5,300	57,000	Expressway (6)	C
Riverside	Indio, South Junction SR-86	4,850	52,000	Expressway (4)	C
Riverside	Eagle Mountain Road	3,000	23,000	Expressway (4)	A
Riverside	Junction SR-177	3,000	23,000	Expressway (4)	A
State Route 78					
Imperial	North Junction SR-86	1,700	18,300	Minor Arterial (2)	B
Imperial	Brawley, West Junction SR-111	2,050	23,300	Minor Arterial (4)	B
Imperial	Brawley, East Junction SR-111	770	7,600	Minor Arterial (4)	A
Imperial	West Junction SR-115	820	5,500	Collector (2)	A
Imperial	East Junction SR-115	530	3,400	Collector (2)	A
State Route 86					
Imperial	El Centro, Junction SR-8	2,600	29,000	Minor Arterial (4)	C
Imperial	Imperial, Imperial Avenue	2,550	28,000	Minor Arterial (4)	C
Imperial	Brawley, South Junction SR-78	1,400	16,200	Minor Arterial (4)	B
Imperial	North Junction SR-78	870	10,800	Minor Arterial (4)	A
Imperial	Salton City, South Marina Drive	1,600	13,800	Minor Arterial (4)	A
Imperial	Salton Sea Beach Road (Brawley Avenue)	1,600	13,800	Minor Arterial (4)	A
Imperial	Desert Shores Drive	1,350	13,100	Minor Arterial (4)	A
Riverside	Coachella, Junction SR-111	1,400	13,100	Minor Arterial (4)	A
State Route 111					
Imperial	Calexico, Second Street	2,650	28,500	Prime Arterial (4)	B

Table 3.20-4 Recent Traffic Volumes and LOS on Key Roadways near the Salton Sea

County	Location	Peak Hour in Peak Direction	AADT in Peak Direction	Classification (# of Lanes)	LOS
Imperial	West Junction SR-86 West	2,550	30,000	Prime Arterial (4)	B
Imperial	Junction SR-8	2,500	31,500	Prime Arterial (4)	B
Imperial	Brawley, East Junction SR-78	1,300	14,300	Minor Arterial (2)	A
Imperial	Calipatria, Junction SR-115	930	7,200	Minor Arterial (2)	A
Imperial	Niland, Niland Avenue	530	3,050	Collector (2)	A
Imperial	Bombay Beach Road	220	1,600	Collector (2)	A
Riverside	Salton Sea State Park Road	310	2,500	Collector (2)	A
Riverside	Mecca, West Junction SR-195	500	4,850	Collector (2)	A

Source: Caltrans 2010b; County of Imperial 2008.

The most recent information available for county roadways within the study area is summarized in Table 3.20-5. Figure 3.20-3 shows the roads and traffic counts near the New River sites, and Figure 3.20-4 shows the roads and traffic counts near the Alamo River. Imperial County has not identified the levels of service on these local county roads, but the traffic counts are well below the 1,900 AADT that is characteristic of LOS A.

Table 3.20-5 Traffic Volumes on County Roadways near the Salton Sea

Roadway	Segment	Weekday Volume	Weekend Volume	Year Data Collected
Bannister	SR-86 to Baker	450	225	2000
Brandt	Lindsey to Sinclair	18	no data	2008
Forrester	SR-78 to Bannister	440	365	2004
Forrester	Bannister to Walker	875	630	2007
Gentry	Walker to Vail	965	1360	2008
Gentry	Eddins to Young	1870	no data	2003
Gentry	Lindsey to Sinclair	1220	no data	2003
Sinclair	Gentry to Garst	800	no data	2003
Lack	Bowles to Lindsey	56	no data	2009
Lack	Vail to Walker	485	no data	1994
Walker	Forrester to Lack	173	no data	2000
Walker	Vendel to Lack	no data	no data	N/A
Lack	Walker to SR-78	no data	no data	N/A
Bannister	Baker to Forrester	no data	no data	N/A

Source: Personal communication, D. Mahaney 2010.

Source: Traffic Data: Personal Communication, D. Mahaney 2010.
Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.20-3 Road Network around New River

Source: Traffic Data: Personal Communication, D. Mahaney 2010.
Aerial Imagery: U.S. Dept. of Agriculture, Nat. Agricultural Imagery Program, Imperial County, 2005.

Figure 3.20-4 Road Network around Alamo River

3.20.3 Impacts and Mitigation Measures

3.20.3.1 Impact Analysis Methodology

The impact assessment methodology used to support the transportation and traffic analysis is based on a comparison of the projected construction and operational traffic to the AADT described above, as well as the location of emergency access routes and the proximity of farm equipment.

Traffic generated by the Project would include trips generated by workers commuting from nearby urban centers, campgrounds, or recreational vehicle facilities to the Project site(s) in light vehicles on a daily basis. It is likely that construction workers would carpool due to the remoteness of the Project sites, but it is conservatively assumed that they would drive separately. Given the distance to the nearest restaurants, it is assumed that both construction and operational workers would only generate one round-trip per day between their home and the Project site(s) and would remain on site for lunch. Workers are assumed to work 235 days per year, and construction is projected to last 2 years.

In addition, trips would be generated by the delivery and removal of construction equipment and the transport of construction materials to the Project site(s). Heavy equipment would operate primarily on site and would not travel to and from the Project site(s) on a daily basis. The heaviest concentration of tractor trailer trips would result from the delivery of rock and gravel to the sites, which would last for approximately 2 to 3 months for both the New and Alamo river sites.

It is assumed that both commuters and tractor trailers would likely approach the Project site(s) by travelling along SR-86 or SR-111, both of which run primarily in a north-south direction and connect the primary population centers of Imperial County. Both highways currently operate at LOS C or better, with most segments in the Project vicinity operating at LOS A (refer to Table 3.20-4).

Specific routes that Project vehicles are anticipated to follow once they leave SR-86 or SR-111 will vary according to alternative and, therefore, are discussed below.

3.20.3.2 Thresholds of Significance

Significance Criteria

Impacts would be significant if the SCH Project would:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and nonmotorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);

- Result in inadequate emergency access; or

- Conflict with adopted policies regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Application of Significance Criteria

A summary of the methodology used in applying the significance criteria to the Project alternatives follows:

- **Conflict with an applicable plan or congestion management program** – The largest increase in traffic would occur during the construction period. Vehicle use by employees during operations and maintenance would be minimal. Therefore, the analysis is based upon the peak construction period, and it is determined whether the Project would reduce the level of service below LOS C, which is Imperial County's desired standard. No congestion management programs are applicable to the study area.

- **Result in a change in air traffic patterns** – The alternatives would not increase air traffic levels or cause a safety issue that would require a change in the location of flight patterns (refer to Section 3.10, Hazards and Hazardous Materials, for a discussion of potential impacts associated with bird air strikes). Therefore, the analysis in the Environmental Impact Statement/Environmental Impact Report does not evaluate changes in air traffic patterns.

- **Substantially increase hazards due to design features or incompatible use –** The alternatives do not include new roads, nor do they involve the realignment of existing roads. The Project does not include design features that would increase hazards. Use of existing roads would be in accordance with design criteria, and the local roads would be restored to their previous condition once construction is completed, so no long-term road hazards would result from Project implementation. Therefore, the analysis in this Environmental Impact Statement/Environmental Impact Report does not evaluate an increase in hazards due to design features. It does consider incompatibilities with farm equipment, however, given the agricultural nature of the Project area.

- **Result in inadequate emergency access –** The alternatives do not include new roads, nor do they involve the realignment of existing roads. Pipeline construction may occur within existing roadways, however, and would introduce tractor trailers and construction equipment to local roads. Therefore, the following analysis evaluates the potential for impacts from construction within roadways and substantial increases in traffic that may reduce emergency response times.

- **Conflict with policies related to alternative transportation –** Neither construction nor operations would affect alternative transportation. As noted above, the proposed bikepath in the Project vicinity is not planned to be built when SCH construction would be underway. The limited amount of traffic during operations would not be incompatible with the use of the bikepath even if it used the same roadways because the Class II bikepath would be in a marked lane for bicycle use only. Rail traffic would not be affected by the SCH Project because trains would not be required, nor would railroad tracks be affected.

3.20.3.3 No Action Alternative

Under the No Action Alternative, roadways would continue to operate as they do currently. Traffic would increase at normal rates, and the segments of state highways and county roads within the Project vicinity would continue to operate at LOS C or better during the period when Project construction traffic would occur.

3.20.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact TRAN-1: The SCH Project would increase traffic during construction and operations, but would not reduce the level of service of any roadways below the County of Imperial's standard (LOS C) (less-than-significant impact). Alternative 1 would require approximately 97 workers during construction. Of the 97 workers, 47 would work on site and would include project managers, foremen, equipment operators, and laborers. These on-site workers would generate up to 47 round-trips in personal vehicle trips per day over the 2-year Project construction period. The remaining 50 workers would operate tractor trailers to deliver materials and equipment to the site on a daily basis. It is assumed that delivery of rock and gravel would produce a maximum of 150 tractor trailer round-trips per day (300 trips) for an approximately 2- to 3-month period. Delivery of equipment and materials like pipe to the Project site from more distant locations would require a maximum of 187 round-trips total over the 2-year construction period, which is the equivalent of approximately one long-distance trip every 2.5 days.

Tractor trailers hauling riprap material to the Project site likely would originate on the northwestern side of the Salton Sea. They would travel south on SR-86, exiting at West Bannister Road where they would travel east for approximately 2 miles before heading north on Bruchard Road for about 4 miles. Workers would also likely approach the Project site by SR-86. Project vehicles coming from the north and traveling southbound along SR-86 would follow the same route as tractor trailers, exiting at West Bannister Road, traveling east, and then turning north on Bruchard Road. Vehicles traveling northbound on SR-86 would likely exit the highway at Lack Road, traveling north, turning west on West Bannister Road, and then turning north on Bruchard Road until reaching the Project site.

As discussed above, state highways in the Project vicinity currently operate at LOS A or B. County roads in the Project vicinity operate at an average daily traffic level ranging from 173 trips per day to 485 trips per day on weekdays, which is well below the threshold for LOS A. Therefore, an additional 158 round-trips per day during the 2- to 3-month peak construction period and an average of 8 round-trips per month during the remainder of the 2-year period would not cause the level of service to fall below LOS C, which is the standard for roads in Imperial County. The Project would not substantially conflict with any applicable transportation plans, and impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Alternative 1 would require two additional habitat management and maintenance personnel for the long-term operation of the SCH ponds. It is anticipated that these two workers would commute from nearby urban centers to the Project site or a nearby facility, generating approximately 2 round-trips a day, 5 days a week. A tractor-trailer would be required approximately 37 days a year for maintenance activities, and heavy equipment would periodically be brought in as well. These trips would have a negligible impact on area roadways, and any impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

Impacts would be less than significant; therefore, no mitigation measures are required.

Residual Impact

Not applicable.

Impact TRAN-2: Construction/maintenance equipment and tractor trailers could be present in areas used by farm equipment, but would not pose a substantial safety hazard (less-than-significant impact). Pipeline construction could follow existing roadways or could cross agricultural fields. Construction equipment would be used within designated rights-of-way in either case. Land would be acquired from a willing landowner, who would be aware of the presence of the construction and maintenance vehicles. If construction followed roads, at least one travel lane would remain open at all

times, and appropriate safety measures would be taken, including the use of flaggers and warning signs. As discussed under Impact TRAN-1, the volume of traffic generated during construction would not exceed LOS C, and the presence of slow-moving vehicles would not be incompatible with farm equipment. As noted, flaggers would be used when appropriate to minimize the conflicts between Project tractor trailers and equipment and other vehicles. Operations and maintenance would involve only minor amounts of traffic and equipment use, and appropriate safety precautions would be taken as needed. Any impacts would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

Impacts would be less than significant; therefore, no mitigation measures are required.

Residual Impact

Not applicable.

Impact TRAN-3: Emergency vehicles would retain their ability to access the Project area during construction and operations despite increased traffic and construction near roadways (less-than-significant impact). As discussed under Impact TRAN-1, neither construction nor operations would result in an unacceptable level of service on any roadways, and the amount of traffic that would be generated on the generally lightly traveled local roadways would not delay emergency access. A potential exists for pipeline installation to occur along existing roadways, but typical roadway safety precautions would be taken (e.g., flaggers, signs warning motorists of roadway work), and at least one travel lane would remain open at all times, thereby ensuring that emergency vehicles could pass. Finally, because emergency vehicles are equipped with sirens, which give advance warning of their approach, construction crews would have the ability to make emergency provisions for safe vehicle passage through construction zones. Impacts, therefore, would be less than significant when compared to both the existing environmental setting and the No Action Alternative.

Mitigation Measures

Impacts would be less than significant; therefore, no mitigation measures are required.

Residual Impact

Not applicable.

3.20.3.5 Alternative 2 – New River, Pumped Diversion

Impact TRAN-1: The SCH Project would increase traffic during construction and operations, but would not reduce the level of service of any roadways below the County of Imperial's standard (LOS C) (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although less traffic would be generated during construction because fewer tractor trailer trips and construction workers would be required. Thirty-seven on-site construction workers would be required, generating up to 37 round-trips per day, and a maximum of approximately 120 round-trips would be generated by tractor trailers hauling rock over an approximately 2- to 3-month period. Delivery of equipment and materials like pipe to the Project site from more distant locations would require a maximum of 126 round-trips (252 trips) total over the 2 year construction period, which is the equivalent of approximately one long-distance trip every 3.7 days.

Impact TRAN-2: Construction/maintenance equipment and tractor trailers could be present in areas used by farm equipment, but would not pose a substantial safety hazard (less-than-significant impact). This impact is applicable to Alternative 2, although a pipeline would not be constructed; thus,

even less of a potential exists for conflict because construction would not occur across farmers' fields or along roads used by farm equipment.

Impact TRAN-3: Emergency vehicles would retain their ability to access the Project area during construction and operations despite increased traffic and construction near roadways (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although a pipeline would not be constructed; thus, even less of a potential exists for construction-related conflicts along roadways.

3.20.3.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact TRAN-1: The SCH Project would increase traffic during construction and operations, but would not reduce the level of service of any roadways below the County of Imperial's standard (LOS C) (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although more traffic would be generated during construction because more tractor trailer trips and construction workers would be required. Fifty-five on-site construction workers would be required, generating up to 55 round-trips per day, and a maximum of approximately 180 round-trips would be generated by tractor trailers hauling rock over an approximately 2- to 3-month period. Delivery of equipment and materials like pipe to the Project site from more distant locations would require a maximum of 153 round-trips total over the 2-year construction period, which is the equivalent of approximately one long-distance trip every 3 days.

Impact TRAN-2: Construction/maintenance equipment and tractor trailers could be present in areas used by farm equipment, but would not pose a substantial safety hazard (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although a pipeline would not be constructed; thus, even less of a potential exists for conflict because construction would not occur across farmers' fields or along roads used by farm equipment.

Impact TRAN-3: Emergency vehicles would retain their ability to access the Project area during construction and operations despite increased traffic and construction near roadways (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although a pipeline would not be constructed; thus, even less of a potential exists for conflict because construction would not occur across farmers' fields or along roads used by farm equipment.

3.20.3.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact TRAN-1: The SCH Project would increase traffic during construction and operations, but would not reduce the level of service of any roadways below the County of Imperial's standard (LOS C) (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although less traffic would be generated during construction because fewer tractor trailer trips and construction workers would be required. Twenty-seven on-site construction workers would be required, generating up to 27 round-trips per day, and a maximum of approximately 60 round-trips would be generated by tractor trailers hauling rock over an approximately 2- to 3-month period. Delivery of equipment and materials like pipe to the Project site from more distant locations would require a maximum of 161 round-trips total over the 2-year construction period, which is the equivalent of approximately one long-distance trip every 2.9 days.

Impact TRAN-2: Construction/maintenance equipment and tractor trailers could be present in areas used by farm equipment, but would not pose a substantial safety hazard (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact TRAN-3: Emergency vehicles would retain their ability to access the Project area during construction and operations despite increased traffic and construction near roadways (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.20.3.8 Alternative 5 – Alamo River, Pumped Diversion

Impact TRAN-1: The SCH Project would increase traffic during construction and operations, but would not reduce the level of service of any roadways below the County of Imperial's standard (LOS C) (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although less traffic would be generated during construction because fewer tractor trailer trips and construction workers would be required. Twenty-five on-site construction workers would be required, generating up to 25 round-trips per day, and a maximum of approximately 54 round-trips would be generated by tractor trailers hauling rock over an approximately 2- to 3-month period. Delivery of equipment and materials like pipe to the Project site from more distant locations would require a maximum of 96 round-trips total over the 2-year construction period, which is the equivalent of approximately one long-distance trip every 4.9 days.

Impact TRAN-2: Construction/maintenance equipment and tractor trailers could be present in areas used by farm equipment, but would not pose a substantial safety hazard (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although a pipeline would not be constructed; thus, even less of a potential exists for conflict because construction would not occur across farmers' fields or along roads used by farm equipment.

Impact TRAN-3: Emergency vehicles would retain their ability to access the Project area during construction and operations despite increased traffic and construction near roadways (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although a pipeline would not be constructed; thus, even less of a potential exists for conflict because construction would not occur across farmers' fields or along roads used by farm equipment.

3.20.3.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact TRAN-1: The SCH Project would increase traffic during construction and operations, but would not reduce the level of service of any roadways below the County of Imperial's standard (LOS C) (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although less traffic would be generated during construction because fewer tractor trailer trips and construction workers would be required. Thirty-four on-site construction workers would be required, generating up to 34 round-trips per day, and a maximum of approximately 72 round-trips would be generated by tractor trailers hauling rock over an approximately 2- to 3-month period. Delivery of equipment and materials like pipe to the Project site from more distant locations would require a maximum of 124 round-trips total over the 2-year construction period, which is the equivalent of approximately one long-distance trip every 3.8 days.

Impact TRAN-2: Construction/maintenance equipment and tractor trailers could be present in areas used by farm equipment, but would not pose a substantial safety hazard (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although a pipeline would not be constructed; thus, even less of a potential exists for conflict because construction would not occur across farmers' fields or along roads used by farm equipment.

Impact TRAN-3: Emergency vehicles would retain their ability to access the Project area during construction and operations despite increased traffic and construction near roadways (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative, although a pipeline would not be constructed; thus, even less of a potential exists for construction-related conflicts along roadways.

3.20.4 References

California Department of Transportation (Caltrans). 2010a. *Brawley bypass*. Website (http://www.dot.ca.gov/dist11/facts/78-111-feb2010.pdf) accessed on October 14.

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Transportation Research Board. 2000. Highway Capacity Manual.

3.20.5 Personal Communications

Amen, Sam. 2010. Project Manager, Caltrans District 11. Personal communication with Megan Stone, Dudek, December 14, 2010.

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3.21 UTILITIES AND SERVICE SYSTEMS

This section addresses the impacts of the Species Conservation Habitat (SCH) Project on stormwater and flood management and solid waste disposal. Impacts associated with increased power demand are addressed in Section 3.6, Energy Consumption. Water supplies for the SCH ponds are addressed in Section 3.11, Hydrology and Water Quality. The study area for utilities includes the SCH sites and landfills that accept nonhazardous materials in Imperial County and landfills that accept hazardous materials in Kings and Kern counties. Although non-hazardous solid waste from the SCH Project could potentially be disposed of in other counties, the analysis focuses on the capacity of Imperial County landfills. Using local facilities would minimize the distance solid waste would have to be transported, thus reducing impacts on other resources, such as air quality and transportation and traffic.

Table 3.21-1 summarizes the impacts of the six SCH Project alternatives on utilities and service systems compared to both the existing conditions and the No Action Alternative.

Table 3.21-1 Summary of Impacts on Utilities and Service Systems

Impact	Basis of Comparison	Project Alternative						Mitigation Measures
		1	2	3	4	5	6	
Impact UT-1: Dust suppression water would be required, but would not exceed supplies.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required
Impact UT-2: Construction and operations would generate solid waste requiring disposal in landfills.	Existing Condition	L	L	L	L	L	L	None required
	No Action	L	L	L	L	L	L	None required

Note:
O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

3.21.1 Regulatory Requirements

3.21.1.1 Stormwater and Flood Management

Federal Clean Water Act of 1977

The Clean Water Act is the primary Federal law that protects our nation's waters, including lakes, rivers, aquifers, and coastal areas. Clean Water Act section 401 requires that any applicant for a Federal permit to conduct any activity, including the construction or operation of a facility, which may result in the discharge of any pollutant, must obtain certification from the state. Clean Water Act section 402 established the National Pollutant Discharge Elimination System to regulate the discharge of pollutants from point sources. Clean Water Act section 404 established a permit program to regulate the discharge of dredged material into waters of the United States.

Porter-Cologne Water Quality Act of 1969

The Porter-Cologne Water Quality Control Act (California Water Code section 13000 et seq.) provides for aesthetic values, fish and wildlife preservation, water reclamation, and comprehensive planning and regulation to attain the highest "reasonable" water quality in consideration of conflicting demands. California's Porter-Cologne Water Quality Control Act, which became California Water Code Division 7 (Water Quality), establishes the responsibilities and authorities of the nine Regional Water Quality Control Boards (previously called Water Pollution Control Boards) and the State Water Resources Control Board, and it directs each regional board to formulate and adopt a water quality control plan for all areas within the region.

3.21.1.2 Solid Waste

Resource Conservation and Recovery Act of 1976

The Resource Conservation and Recovery Act was enacted in 1976 and is the principle Federal law governing the disposal of solid waste and hazardous waste (Title 40, Code of Federal Regulations, Part 260). The Resource Conservation and Recovery Act's Subtitle D establishes state responsibility for regulating nonhazardous wastes, and Subtitle C controls the generation, transportation, storage, and disposal of hazardous waste through a comprehensive "cradle-to-grave" system of hazardous waste management techniques and requirements. The U.S. Environmental Protection Agency is responsible for implementing the law, a duty that is delegated to the California Department of Toxic Substances Control in the state of California.

California Integrated Waste Management Act of 1989

The California Integrated Waste Management Act of 1989 (Assembly Bill [AB] 939) regulates nonhazardous solid waste. The law provides a solid waste management system to reduce, recycle, and reuse solid waste generated in the state to the maximum extent feasible in an efficient and cost-effective manner to conserve natural resources, to protect the environment, and to improve landfill safety. Local agencies are required to establish recycling programs, reduce paper waste, purchase recycled products, and implement integrated waste management programs that conform to the state's requirements (California Public Resources Code section 40000 et seq.). AB 939 specifically required that each city and county in California divert 25 percent of its waste stream by 1995 and 50 percent by 2000. AB 939 states that each city and county in the state of California must manage waste disposal through the implementation of the Source Reduction and Recycling Element, which was adopted in December 1993. Under the Source Reduction and Recycling Element, counties must demonstrate how they will achieve the mandated diversion goals through the implementation of diversion programs (County of Imperial Public Works Department 2010).

Integrated Waste Management Plans

Each state agency and large state facility was required to develop an integrated waste management plan by July 1, 2000. The plan was to lay out how the agency or facility would divert at least 25 percent of its solid waste from landfills or transformation facilities by January 1, 2002, and 50 percent by January 1, 2004. Annual reporting on implementation of the plans is also required. Imperial County completed its Integrated Waste Management Plan by 2000 and has not updated it since its original release (personal communication, L. Davies 2010).

Imperial County General Plan

The Land Use Element of the Imperial County General Plan (County of Imperial 2008) includes a number of goals and objectives that relate to providing adequate utilities and service systems within the county.

3.21.2 Affected Environment

3.21.2.1 Stormwater and Flood Management

Portions of Imperial County are subject to flooding, including areas within the immediate vicinity of the Salton Sea and the New and Alamo rivers (California Department of Water Resources 2010; County of Imperial 2007). The Imperial County Department of Public Works regulates stormwater management throughout the county through review of drainage plans for new development.

3.21.2.2 Solid Waste

Landfills are classified as Class I, Class II, and Class III. Class I landfills are designated specifically for the dumping of hazardous wastes. Class II landfills are for designated and/or special waste, including biosolids. A Class III landfill is designated for the dumping of nonhazardous wastes, such as municipal waste. Trash collection and recycling services within the county are supplied by Allied Waste Management (Imperial Valley Economic Development Corporation 2007). Imperial County currently administers and operates 10 Class III landfills, in addition to privately operated landfills. Two Class I landfills are located in California: Safety Kleen's Buttonwillow Landfill in Kern County and Chemical Waste Management's Kettleman Hills Landfill in Kings County. Solid waste landfills in Imperial County are operated by the County of Imperial Public Works Department and by private operators. The solid waste disposal facilities in Imperial County and Class I landfills in Kings County and Kern County are listed in Table 3.21-2.

In July 2010, Imperial County proposed an expansion to the Salton City Landfill to allow an increase in permitted tons per day of solid waste from 50 tons per day to as much as 6,000 tons per day by 2022, and to accept solid waste from other cities and counties in the region. The proposed expansion would increase the existing landfill's disposal area within its property from 7.8 acres to 287 acres and would extend the life of the landfill by approximately 28 years (CEQAnet 2010).

Table 3.21-2 Solid Waste Landfill Waste Types and Capacity

Landfill	Class	Waste Types	Maximum Permitted Capacity (tons/day)	Maximum Permitted Capacity (cubic yards)	Remaining Capacity (cubic yards)[a]	Estimated Closure Date
Imperial Solid Waste Site	III	Construction/ demolition, dead animals, mixed municipal	207	1,936,000	183,817	2015
Niland Solid Waste Site	III	Construction/ demolition, mixed municipal	55	131,000	44,053	2040
Salton City Solid Waste Site[b]	III	Construction/ demolition, mixed municipal	10	2,581,300	11,753	2017
Allied Imperial Landfill	III	Agricultural, ash, construction/ demolition, mixed municipal, industrial, tires	1,135	4,324,200	1,901,305	2012

Table 3.21-2 Solid Waste Landfill Waste Types and Capacity

Landfill	Class	Waste Types	Maximum Permitted Capacity (tons/day)	Maximum Permitted Capacity (cubic yards)	Remaining Capacity (cubic yards)[a]	Estimated Closure Date
Monofill Facility (Brawley)	II	Industrial	750	1,729,800	1,058,2525	2025
Mesquite Regional Landfill	III	Municipal solid waste	20,000	N/A	600 million tons	2097
Chemical Waste Management Kettleman Hills Landfill (Kings County)	I	Municipal solid waste and hazardous waste	8,000	10,700,000	6,000,000	Not Available
Clean Harbors Buttonwillow Landfill (Kern County)	I	Municipal solid waste and hazardous waste	10,480	14,290,000	Not Available	2040

Source: California Department of Resources Recycling and Recovery 2010.

[a] These estimates are from November 10, 2010; the actual number changes regularly as solid waste is disposed.

[b] Salton City Solid Waste Site is anticipated to expand its facility from 50 to 6,000 tons per day by 2022 (CEQAnet 2010)

3.21.3 Impacts and Mitigation Measures

3.21.3.1 Impact Analysis Methodology

The impact assessment methodology compared the demand for utilities and service systems resulting from the SCH alternatives to the existing capacity.

3.21.3.2 Thresholds of Significance

Significance Criteria

Impacts would be significant if the SCH alternatives would:

- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Require new or expanded entitlements due to lack of sufficient water supplies available to serve the Project;

- Result in a determination by the wastewater treatment provider that serves or may serve the Project that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments;
- Exceed the permitted capacity of a landfill to accommodate the Project's solid waste disposal needs; or
- Not comply with Federal, state, and local statues and regulations related to solid waste.

Application of Significance Criteria

A summary of the methodology used in applying the significance criteria to the Project alternatives follows:

- **Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board** – The Project sites would be served by portable restroom facilities during both construction and operation, and all waste would be disposed of in accordance with appropriate regulations. Construction and operation of the SCH Project would not exceed wastewater treatment requirements, and such impacts are not addressed further. It is estimated that fewer than 50 out-of-town construction workers and their families could temporarily reside in the areas surrounding the Salton Sea during the 2-year construction period. Only a small number of employees would be required during operations. These minor increases in population would not cause an exceedance of wastewater treatment requirements, and this impact is not discussed further.
- **Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities** – Bottled water would be brought to the Project sites during construction and operations; therefore, no impacts on local potable water treatment facilities would occur as a direct result of construction and operation at the sites. The Project sites would be served by portable restroom facilities during both construction and operation, and the expansion or construction of wastewater treatment facilities would not be required. Impacts from out-of-town construction workers and their families temporarily residing in the area and from the permanent employees would be negligible and would not require the construction of new water or wastewater treatment plants; thus, such impacts are not addressed further.
- **Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities** – The Project alternatives would not require construction of new storm water drainage facilities or expansion of existing facilities because pond construction would provide all necessary onsite water retention, and the Project has been designed so that diversion of water from the rivers would not cause water to back up and flood adjacent areas (refer to Section 3.11, Hydrology and Water Quality for additional discussion). The Project would not increase onsite or offsite runoff that would necessitate additional drainage infrastructure.
- **Require new or expanded entitlements due to lack of sufficient water supplies** – Construction and operations at the SCH sites would rely on bottled water for potable uses and would not require new water supplies or water entitlements. Impacts from out-of-town construction workers and their families temporarily residing in the area and from the permanent employees would be negligible and would not require new water supplies. Impacts from the use of dust suppression water during construction are addressed below.
- **Result in a determination by the wastewater treatment provider that it has inadequate capacity to meet the Project's demand** – The Project sites would be served by portable restroom facilities during both construction and operations and would not affect the capacity of municipal or regional wastewater treatment systems; therefore, impacts on wastewater treatment systems from construction and operations at the SCH sites are not addressed. It is estimated that fewer than 50 out-of-town

construction workers and their families could temporarily reside in the areas surrounding the Salton Sea during the 2-year construction period; additionally, only permanent employees would be required. This minor increase in population would not cause an exceedance of wastewater treatment capacity.

- **Exceed the permitted capacity of a landfill** – The impact analysis addresses the capacity of landfills to accept solid waste generated by the SCH Project. Solid waste generated by the out-of-town construction workers and their families, as well as the permanent employees would be minor and would not cause an exceedance of solid waste capacity; such impacts are not discussed further.
- **Not comply with Federal, state, and local statues and regulations related to solid waste** – All solid waste would be disposed of in accordance with appropriate regulations.

3.21.3.3 No Action Alternative

As described in the *Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report* (California Department of Water Resources and California Department of Fish and Game 2007), the No Action Alternative would involve construction and operations and maintenance activities for pupfish channels. Additionally, Imperial Irrigation District (IID), as mitigation for the IID Water Conservation and Transfer Project, is required to relocate campgrounds, roads, and trails that are currently located adjacent to the Salton Sea at the Salton Sea State Recreation Area, as well as boat launches along the shoreline. These actions would result in minor amounts of solid waste requiring disposal in area landfills.

Canals constructed along the shoreline would be designed to avoid conflicts with stormwater drainage. Therefore, no impacts to existing stormwater facilities would occur.

Construction workers would increase the demand for water and wastewater treatment, but it is not anticipated that new or expanded capacity would be required to meet their needs.

3.21.3.4 Alternative 1 – New River, Gravity Diversion + Cascading Ponds

Impact UT-1: Dust suppression water would be required, but would not exceed existing supplies (less-than-significant impact). Water would be trucked in for dust suppression during construction; this temporary increased demand (estimated at 4,000 to 12,000 gallons per day) would be minor in comparison to the overall demand in the area (IID alone supplies approximately 2,567,000 acre-feet of water per year [IID 2010], or 836,460,629,180 gallons). Adequate supplies are available for this temporary increase; therefore, this impact would be less than significant when compared to both the existing environmental setting and No Action Alternative.

Impact UT-2: Construction and operations would generate solid waste requiring disposal in landfills (less-than-significant impact). Solid waste would be generated primarily during construction. The primary sources of solid waste requiring disposal would include trash generated by work crews and equipment maintenance, as well as construction waste from building pump stations, concrete formwork, and other facilities. Approximately 100 tons would be generated through these activities. Materials generated by on-site brush clearing, as well as materials such as rock, concrete, and wood would be left on site for pond bottom substrate and would not require disposal. Sediment dredged and stockpiled during construction and during maintenance of the sedimentation basin would be incorporated back into the surrounding berms and also would not require disposal. Should testing show the presence of contaminated soil, or if such soil was observed during construction activities, such material would be hauled off site and transported to an appropriate waste facility. The local landfills and those accepting hazardous waste in Kern and Kings counties have adequate capacity to accept the types of materials that would be generated

during construction; therefore, impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative.

Operations would result in minor amounts of solid waste generated by the permanent employees, equipment maintenance, and general maintenance activities. Adequate landfill capacity is available, and impacts would be less than significant when compared to both the existing environmental setting and No Action Alternative.

3.21.3.5 Alternative 2 – New River, Pumped Diversion

Impact UT-1: Dust suppression water would be required, but would not exceed supplies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact UT-2: Construction and operations would generate solid waste requiring disposal in landfills (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.21.3.6 Alternative 3 – New River, Pumped Diversion + Cascading Ponds

Impact UT-1: Dust suppression water would be required, but would not exceed supplies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact UT-2: Construction and operations would generate solid waste requiring disposal in landfills (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.21.3.7 Alternative 4 – Alamo River, Gravity Diversion + Cascading Pond

Impact UT-1: Dust suppression water would be required, but would not exceed supplies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact UT-2: Construction and operations would generate solid waste requiring disposal in landfills (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.21.3.8 Alternative 5 – Alamo River, Pumped Diversion

Impact UT-1: Dust suppression water would be required, but would not exceed supplies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact UT-2: Construction and operations would generate solid waste requiring disposal in landfills (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.21.3.9 Alternative 6 – Alamo River, Pumped Diversion + Cascading Ponds

Impact UT-1: Dust suppression water would be required, but would not exceed supplies (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

Impact UT-2: Construction and operations would generate solid waste requiring disposal in landfills (less-than-significant impact). The discussion under Alternative 1 is applicable to this alternative.

3.21.4 References

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SECTION 4

CUMULATIVE IMPACTS

This section describes the cumulative impact assessment methodology, projects considered in the cumulative impact assessment, and potential cumulative impacts that would occur if these projects were implemented along with any one of the Species Conservation Habitat (SCH) Project alternatives.

4.1 CUMULATIVE IMPACT METHODOLOGY

The Council on Environmental Quality (40 Code of Federal Regulations [CFR] sections 1508.7 and 1508.25[a][2]) and the California Environmental Quality Act (CEQA) Guidelines (14 California Code of Regulations [CCR] section 15130) require a reasonable analysis of the significant cumulative impacts of a proposed action. The Council on Environmental Quality's regulations implementing the National Environmental Policy Act (NEPA) define a "cumulative impact" as follows:

> Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future action regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR section 1508.7).

The CEQA Guidelines define cumulative impacts similarly:

> "Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.
>
> (a) The individual effects may be changes resulting from a single project or a number of separate projects.
>
> (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probably future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CCR section 15355).

In addition, CEQA Guidelines section 15130(a)(1) states:

> As defined in section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the Environmental Impact Report (EIR) together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

Furthermore, CEQA Guidelines section 15064(h)(4) states:

> The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

For the purposes of this Environmental Impact Statement/Environmental Impact Report (EIS/EIR), significant cumulative impacts would occur if the potential impacts related to SCH Project implementation, added to the impacts from other past, present, and reasonably foreseeable future projects in the region, would result in a significant effect. Federal, state, and local agencies and tribal governments with planning and regulatory authority in Imperial County were contacted to identify projects that may result in a cumulative impact. These projects then were examined for their potential to result in a cumulative impact when combined with the SCH Project. Projects included in the cumulative impact analysis were identified using a list approach and are those that could result in impacts on the same resources in the same geographic areas as the SCH Project alternatives. The general area that was considered in the cumulative impact analysis is limited to Imperial County. The geographic scope for each individual resource is described in Section 4.3.

4.2 ANALYSIS OF CUMULATIVE IMPACTS BY PROJECT

This section describes the projects included in the cumulative impact analysis, the status of their environmental documentation, and anticipated environmental impacts of those projects (identifying only those resources that also would be affected by the SCH Project alternatives). Cumulative projects are discussed in alphabetical order below.

4.2.1 United States Army Corps of Engineers Section 404 Permit Projects

4.2.1.1 Project Description

According to the United States (U.S.) Army Corps of Engineers (Corps) database (ORM II), between 1995 and 2010, the Corps issued a total of 36 section 404 permits within the Salton Sea Hydrologic Unit Code 8 watershed within Imperial County (Figure 4-1) (Appendix K). The authorizations issued are in the following categories: flood control, bank stabilization, recreation, restoration, linear transportation, boat docks, utility lines, and canal lining.

4.2.1.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

Of the 36 permits issued in the Salton Sea watershed, 34 actions were for minor impacts to waters of the U.S. that were general permits authorized under the Corps' nationwide permit (NWP) program or regional general permits. General permit verifications authorized the discharge (placement) of fill material into 57.4 acres of waters of the U.S. and required 134.37 acres of mitigation. As documented in the NEPA decision documents for the reauthorization of the NWP Program in 2007, the majority of NWPs result in temporary impacts on aquatic resources. As a result, the Corps determined that the NWP Program results in minimal impacts, both individually and cumulatively. Two Standard Individual Permits were issued within this watershed, which authorized discharges of dredged and/or fill material into a maximum of 54.01 acres of waters of the U.S. and required 255.39 acres of compensatory mitigation (preservation, enhancement, restoration, and/or creation). Not including the proposed SCH Project, authorized impacts from all permits within the Salton Sea watershed issued since 1995 total 111.41 acres, with 389.7 acres of compensatory mitigation throughout the Salton Sea watershed. Within the HUC 8 watershed of the Salton Sea approximately a 3.5:1 compensatory mitigation to impact ratio was required.

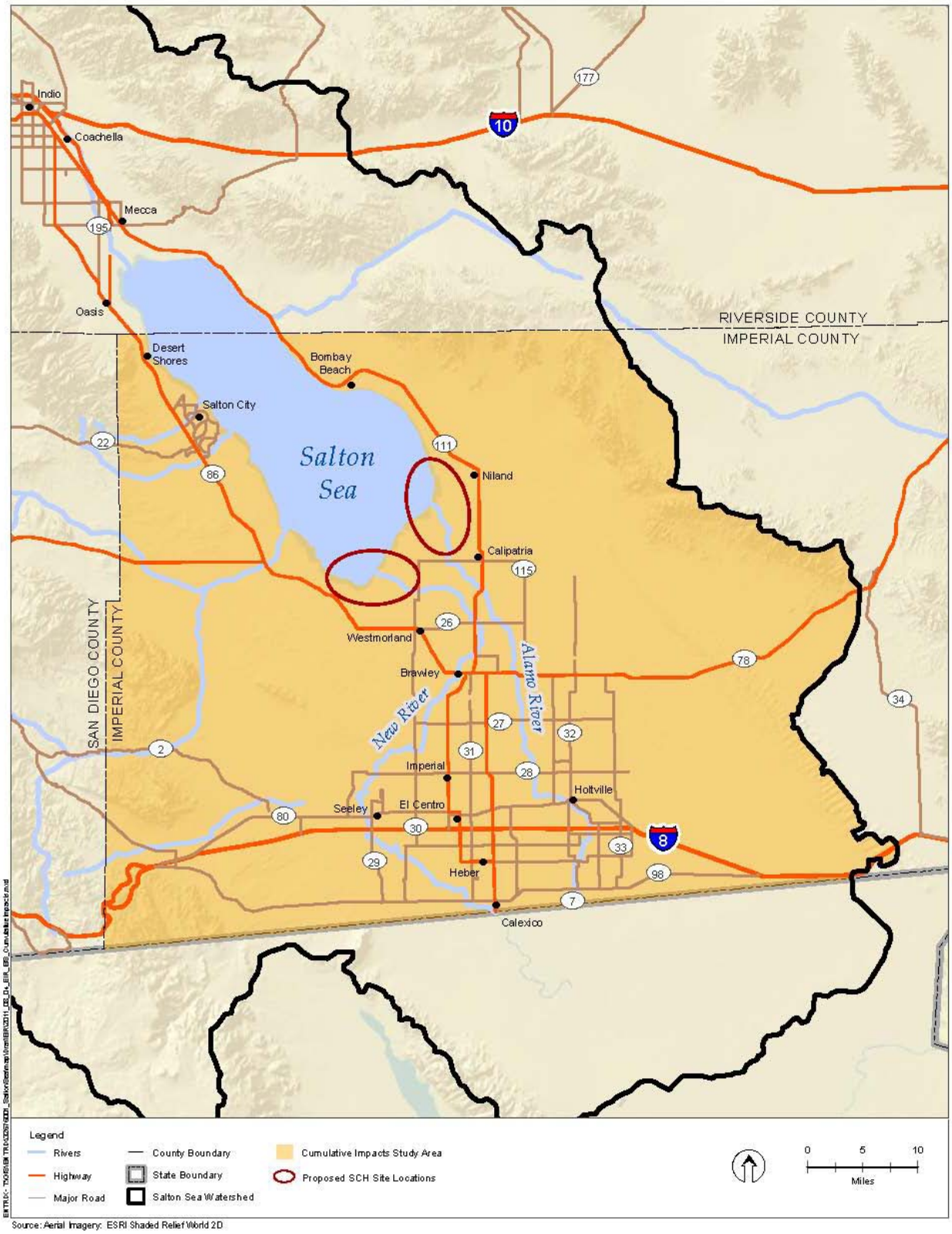

Figure 4-1 General Geographic Scope of Cumulative Impact Analysis

4.2.2 Allied Imperial Landfill Expansion Project

4.2.2.1 Project Description

Allied Imperial Landfill, a Class III nonhazardous solid waste landfill, is currently approaching capacity. Imperial Landfill, Inc. proposes to construct an 89-acre new cell to the west of the existing landfill and to increase the maximum height of the existing and new landfill to 130 feet. This proposed expansion would expand the life of the landfill to approximately 30 years. The Allied Imperial Landfill Expansion Project also includes "...redesign of the facility, addition of a public drop-off facility, relocation of the scale house, increased recycling operations, and use of offsite borrow sites to supply soil for landfill cover operations" (Imperial County Planning Commission 2010, pg. ES-1). The existing and proposed landfill is located on Imperial County Assessor's Parcel Number 044-030-006-000, which is in an unincorporated area of Imperial County, south of Neckel Road, east of Dogwood Road, north of Robinson Road, and northeast of the city of Imperial.

4.2.2.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

Imperial County Planning Commission issued the Final EIR for the Allied Imperial Landfill Expansion Project in March 2010 and published a Notice of Determination approving the project on September 23, 2010. The project would result in a variety of significant impacts, which would be mitigated to less-than-significant levels. These impacts would include: aesthetics (degradation of visual character in an area of 20 homes within 0.5 mile of the project site; requirement of new aircraft safety lights); air quality (operations would contribute to increases in regional emissions of nitrogen oxides [NO_x], particulate matter 10 microns or smaller in diameter [PM_{10}], and particulate matter 2.5 microns or smaller in diameter [$PM_{2.5}$]); biological resources (native birds impacts due to construction and permanent habitat loss); cultural resources (construction could affect previously unidentified cultural sites, human remains, and paleontological sites); hazards and hazardous materials (excavations could uncover impacted/contaminated soils); noise (noise by activity on the working face of the landfill; noise by green waste processing; noise by construction, demolition, and inert debris facility processing; and noise from heavy earthmoving equipment operation); public services and recreation (impacts on the available water supply for sustained response by the fire department); and traffic (increase in traffic on surrounding roads due to increased hauling; inadequate emergency access) (Imperial County Planning Commission 2010).

4.2.3 Black Rock 1, 2, and 3 Geothermal Power Project (formerly Salton Sea Unit 6 Power Project)

4.2.3.1 Project Description

CE Obsidian Energy, LLC (Applicant) currently possesses a license with the California Energy Commission (CEC), issued in December 2003, to construct a 185-megawatt (MW) geothermal generating plant designated as Salton Sea Unit 6 on an 80-acre site adjacent to the Sea's southern shore in Imperial County, California. This original license was amended in May 2005 to allow the plant to increase its capacity to 215 MW. The Applicant petitioned, and the CEC subsequently granted, an extension to the Salton Sea Unit 6 license, making it effective until December 18, 2011 (CEC 2009).

On March 13, 2009, the Applicant filed a Petition for Major Amendment with the CEC to allow for the construction of three smaller geothermal plants totaling 159 MW net of generating capacity instead of the originally proposed 185 MW and 215 MW projects. This amended project is known as Black Rock 1, 2, and 3 Geothermal Power Project (Black Rock Project). Both the 185 MW and 215 MW projects previously proposed using multiple flash geothermal power-generating technology, while the Black Rock Project proposes using single flash technology, which requires less facility infrastructure and produces less waste compared to multiple flash technology (CEC 2009).

The Black Rock Project is within the Salton Sea Known Geothermal Resource Area, which extends from about Bombay Beach to Calipatria. The three units proposed for the Black Rock Project would be co-located on the same site as the original Salton Sea Unit 6 project and would share various common auxiliary facilities. The site is currently used for agriculture and surrounding land uses include existing geothermal power facilities, agriculture, and Sonny Bono Salton Sea National Wildlife Refuge. The Salton Sea Unit 6 project site was composed of an 80-acre site bounded on the north by McKendry Road, on the east by Boyle Road, on the west by Severe Road, and on the south by Peterson Road. The Black Rock Project would include an additional 80 acres adjacent to the south, plus the original 80-acre site. Part of the additional 80 acres was used for construction support in the original Salton Sea Unit 6 project. The three Black Rock Project power plants would be situated generally in the middle of the site with production well pads on the site's northern, western, and southern perimeters (CEC 2009).

The Black Rock Project is currently on hold because the CEC is still reviewing the Major Amendment proposed in March 2009. The Major Amendment is expected to be approved by the mid 2011 with construction of the Black Rock Project planned to begin in the end of 2011 (personal communication, D. Rundquist 2010).

4.2.3.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

Environmental documents for the proposed Major Amendment have not been completed to date. However in 2003, the Applicant prepared an Application for Certification for the Salton Sea Unit 6 project, which is assumed to have similar anticipated environmental impacts as the Black Rock Project. Construction of the Black Rock Project would result in a variety of short-term construction impacts related to air quality, soils/geologic hazards, water quality/erosion, biological resources, cultural resources, paleontological resources, land use, and traffic and transportation. All of these impacts would be mitigated to less-than-significant levels. However, this project would have a beneficial impact on socioeconomics in Imperial County (California Department of Water Resources [DWR] and California Department of Fish and Game [DFG] 2007).

4.2.4 Chocolate Mountains Solar Farm

4.2.4.1 Project Description

The Chocolate Mountains Solar Farm project is a 49.9 MW utility-scale photovoltaic (PV) solar power plant that would generate enough electricity to power over 20,000 households. This project's two optional PV solar panel setups include (1) between 260,000 and 320,000 nonreflective PV panels mounted together (nontracking), standing about 6 to 7 feet in height, and tilted 25 degrees from horizontal to the south; (2) between 160,000 and 210,000 nonreflective PV panels mounted together on a single axis tracking system, standing about 12 to 15 feet in height, and tilted between 20 and 25 degrees from horizontal to the south (CEQAnet 2010a). The Chocolate Mountains Solar Farm is located on 320 acres of land in the foothills of Imperial County's Chocolate Mountains, east of the Salton Sea, northwest of Niland, and southeast of Wister.

4.2.4.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

A Mitigated Negative Declaration (MND) was prepared for Imperial County Planning and Development Services Department in June 2010. Currently, the Chocolate Mountains Solar Farm project is in advanced permitting and engineering stages, and is targeted to be operational in 2012 (8minutenergy Renewables, LLC 2011).

4.2.5 Desert Springs Resort Specific Plan

4.2.5.1 Project Description

The Desert Springs Resort Specific Plan would be a master planned outdoor desert recreational resort community on approximately 1,105 acres of undeveloped land in an unincorporated area of Imperial County, northwest of El Centro, California. Specifically, the Specific Plan area is located northwest of the intersection of Boley Road and Westmorland Road, and adjacent to the Westside Main Canal. This community would include up to 411 water sport lots, up to 792 recreational vehicle lots, up to 22 estate lots, up to 150 vacation villas, and up to 100 garage villas. A series of interconnecting lakes and navigable waterways would connect the residential units with other resort features: a clubhouse with a restaurant and pool, a boat dock, spa facilities, satellite recreational facilities, open space, and an executive golf course. The last major feature of this master planned community would be a racetrack/road course, which would include a garage pit area, commercial lots, retail/food court, and road course administration facilities. The Desert Springs Resort is scheduled to open in 2015 (County of Imperial 2010a).

4.2.5.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

BRG Consulting, Inc. prepared a Draft EIR for the Desert Springs Resort Specific Plan for the County of Imperial in May 2010. No significant unavoidable environmental impacts associated with the construction and operations of the project were identified in the Draft EIR. The following resource areas were found to have significant impacts as a result of construction, occupancy, and operation of the proposed project, but by implementing the proposed mitigation measures, these impacts would be reduced to less-than-significant levels: air quality (fugitive dust and PM_{10} emissions during grading/operational phases contribute to air quality impacts; aggregate operational exceedance emissions in carbon monoxide, NO_x, and reactive organic gases); agricultural resources (conversion of existing farmlands to other uses and the permanent loss of 539 acres of Prime Farmland and Farmland of Statewide Importance); biological resources (direct permanent impacts on western burrowing owls from vegetation community disturbance); cultural resources (an archaeological site is on the project site that is eligible for inclusion in the California Register of Historic Resources); geology/soils (project site is potentially subject to surface rupture/faulting; potential for liquefaction on southeastern flank of site; site underlain by clays of moderate to high expansion potential; potential for differential settlement on the project site; and construction would result in wind- and water-driven erosion of soils); hazards and hazardous materials (asbestos in on-site underground irrigation pipes; contamination from pesticides and herbicides from legacy farming operations on-site; miscellaneous debris/burnt debris on project site indicates the potential presence of dioxin; and significant staining from oil around an on-site trailer was observed); hydrology and water quality (short-term impact on surface water quality); noise (interior noise levels of residential units would increase); public services and utilities (increased demand for fire safety-related services; and generation of additional students going to existing schools in area); and traffic and transportation (adding additional lanes) (County of Imperial 2010a).

4.2.6 East Brawley Geothermal Development Project

4.2.6.1 Project Description

The East Brawley Geothermal Development Project is proposed to be located north of the City of Brawley, east of State Route 111, north of State Route 78, directly west of Dietrich Road, directly south of Rutherford Road, and east of the New River. Although the geothermal plant is proposed to be located on 33.7 acres, the area containing the geothermal wells and pipelines that would connect to the plant covers approximately 3,033 acres (County of Imperial 2011). This project proposes to construct a new 49.9 MW power plant containing up to six Ormat Energy Converters (16 MW gross each), approximately 36 total geothermal wells (half for injection and half for production), and a substation with a 2-mile long double-circuit 13.8 and 92 kilovolt transmission line, which would interconnect at the North Brawley 1

Geothermal Power Plant's substation (County of Imperial 2011). In addition, this project would include a pipelines to carry geothermal brine to the power plant, pipelines to carry cooled brine to injection wells, pipelines to distribute noncondensable gas from production wells to the power plant area and injection wells, and a water pipeline to bring water from Imperial Irrigation District's (IID's) Rockwood Canal to the power plant for cooling water (County of Imperial 2011).

4.2.6.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

The County of Imperial published a Draft EIR in March 2011. No significant unavoidable environmental impacts associated with the construction and operations of the project were identified in the Draft EIR. The following resource areas were found to have significant or potentially significant impacts as a result of construction, occupancy, and operation of the proposed project, but by implementing the proposed mitigation measures, these impacts would be reduced to less-than-significant levels: aesthetics (introduce new sources of light and glare, resulting in an increase in ambient light and glare levels); air quality (construction would result in short-term emissions of criteria air pollutants from construction equipment operation and soil disturbances; and project operations would result in long-term emissions of criteria air pollutants from mobile and area sources, and in low levels of hazardous air pollutant emissions in the vicinity of the project site); biological resources (direct and indirect loss of habitat and individuals of plant and animal species of endangered, threatened, rare, proposed, and candidate status, as well as species of concern, listed as "fully protected" in the California Fish and Game Code [i.e., southwestern willow flycatcher, western burrowing owl, Sierra Nevada red fox, American badger, California wolverine, riparian habitat and Federally protected wetlands]); cultural resources (impacts on prehistoric resources or undiscovered paleontological resources within project boundaries); geology/soils (project site is located in a seismically active area; construction would result in soil erosion and loss of topsoil; and site underlain by clays of moderate to high expansion potential); hazards and hazardous materials (construction and operation of the project would result in use, storage, and disposal of hazardous materials); hydrology and water quality (construction and build-out of the project would result in accelerated erosion and sedimentation to local waterways; construction and build-out would result in an increase in impervious surfaces and structures, which would result in an increase in runoff and pollutants to local waterways, possibly exceeding existing stormwater capacity); land use (project would temporarily increase the intensity of land use and would place industrial development in an unincorporated area of Imperial County that is predominantly agriculture); and public services (increased demand for fire protection services over existing levels) (County of Imperial 2011).

4.2.7 Imperial Solar Energy Center South

4.2.7.1 Project Description

The Imperial Solar Energy Center South project would include the construction and operation of a 200 MW ground-mounted PV solar power generating system, supporting structures, an operations and maintenance building, a substation, a water treatment facility, a plant control system, a meteorological station, roads, and fencing. This project would be developed on 946.6 acres of privately owned, undeveloped and agricultural land (United States [U.S.] Bureau of Land Management [BLM] and County of Imperial 2010a). This PV solar power generating system would transfer its electricity to the Imperial Valley Substation via 230-kilovolt transmission lines. An approximately 5-mile-long, 120-foot-wide right-of-way would be established from the project site, along BLM land, to the existing Imperial Valley Substation (CEQAnet 2010b). Imperial Solar Energy Center South would be located in an unincorporated area of Imperial County near the intersection of Pullman and Anza roads, approximately 10 miles west of Calexico, immediately north of the United States-Mexico international border, and directly adjacent to the All-American and Westside Main canals (BLM and County of Imperial 2010a).

4.2.7.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

Imperial County Planning and Development Services Department published an NOP to prepare an EIR in June 2010. The NOP states that a corresponding NEPA environmental assessment (EA) will be prepared to address the Applicant's proposed 120-foot right-of-way along BLM land (Imperial County Planning and Development Services Department 2010a). BRG Consulting, Inc. prepared a Draft EIR/EA for Imperial Solar Energy Center South for BLM and the County of Imperial by in December 2010. No significant unmitigable environmental impacts associated with the construction and operations of the proposed project were identified in the Draft EIR/EA. The following resource areas were found to have significant impacts as a result of construction, occupancy, and operation of the proposed project, but by implementing the proposed mitigation measures, these impacts would be reduced to less-than-significant levels: air quality (NO_x emissions would present an air quality impact during the project grading/clearing/hauling phases); agricultural resources (conversion of existing farmlands to other nonagricultural uses would result in a permanent loss of 478.9 acres of Prime Farmland and 341.8 acres of Farmland of Statewide Importance); biological resources (permanent impact on 847.1 acres of vegetation communities and a temporary impact on 857 acres of vegetation communities; western burrowing owl impacts during construction and operation; flat-tailed horned lizard impacts during construction and operations; nesting raptor impacts if construction occurs during breeding season; migratory bird impacts if construction occurs during breeding season; and impacts during construction on streambeds under the jurisdiction of DFG, associated vegetation, Regional Water Quality Control Board waters of the state, and waters of the United States [U.S.]); cultural resources (two previously recorded archaeological sites are located on the project site, and seven adjacent archaeological sites that may be affected by runoff, etc., during construction); geology/soils and mineral resources (site is underlain by expansive soils; the four conditions for liquefaction all occur on the project site; there is the potential for corrosive soils on the project site; there is potential for differential settlement on the project site; and water-driven erosion of soils during construction would occur); health, safety and hazardous materials/fire and fuels management (miscellaneous debris/burnt debris located on the project site; and the use of herbicides for weed control during construction and operation would potentially impact health and safety); paleontological resources (project site potentially overlays undiscovered paleontological resources, which could be uncovered during construction); and transportation and circulation (there would be an increase in traffic in the area during construction) (BLM and County of Imperial 2010b).

4.2.8 Imperial Solar Energy Center West

4.2.8.1 Project Description

The Imperial Valley Solar Energy Center West project would include the construction and operation of a 250 MW ground-mounted PV solar power generating system, supporting structures, an operations and maintenance building, a substation, a water treatment facility, a plant control system, a meteorological station, roads, and fencing. This project would be developed on 1,130 acres of privately owned, economically unviable agricultural land (BLM and County of Imperial 2010b). Similar to Imperial Solar Energy Center South, this project would transfer its electricity to the Imperial Valley Substation via 230-kilovolt transmission lines. An approximately 5-mile-long, 120-foot-wide right-of-way would be established from the project site, along BLM land, to the Imperial Valley Substation (CEQAnet 2010c). Imperial Solar Energy Center West would be located in an unincorporated area of Imperial County to the north and south of Interstate 8, east of Reynolds Road, and west of the Westside Main Canal (BLM and County of Imperial 2010b).

4.2.8.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

Imperial County Planning and Development Services Department published a NOP to prepare an EIR in June 2010. The NOP states that a corresponding NEPA EA will be prepared to address the Applicant's

proposed 120-foot right-of-way along BLM land (Imperial County Planning and Development Services Department 2010b). BRG Consulting, Inc. prepared a Draft EIR/EA for Imperial Solar Energy Center West for BLM and the County of Imperial in November 2010. No significant unavoidable environmental impacts associated with the construction and operations of the proposed project were identified in the Draft EIR/EA. The following resource areas were found to have significant impacts as a result of construction, occupancy, and operation of the proposed project, but by implementing the proposed mitigation measures, these impacts would be reduced to less-than-significant levels: air quality (NO_x emissions would present an air quality impact during the project grading/clearing/hauling phases); agricultural resources (conversion of existing farmlands to other nonagricultural uses would result in a permanent loss of 1,048.4 acres of Farmland of Local Importance); biological resources (permanent impact on 1,078.3 acres of vegetation communities and a temporary impact on 1,085.2 acres of vegetation communities; western burrowing owl impacts during construction and operation; flat-tailed horned lizard impacts during construction and operations; nesting raptor impacts if construction occurs during breeding season; migratory bird impacts if construction occurs during breeding season; and impacts during construction on U.S. Army Corps of Engineers jurisdictional waters, DFG streambeds and associated vegetation, Regional Water Quality Control Board waters of the state, and waters of the U.S.); cultural resources (three newly identified archaeological sites are located on the project site, and 11 adjacent archaeological sites may be affected by runoff during construction); geology/soils and mineral resources (site is underlain by expansive soils; there is potential for corrosive soils on the project site; and the potential for water-driven erosion of soils during construction); health, safety and hazardous materials (miscellaneous debris/burnt debris located on the project site; and the use of herbicides for weed control during construction and operation would potentially impact health and safety); hydrology and water quality (impacts from urban nonpoint source pollution during construction and post-construction activities; and 0.5 acre of U.S. Army Corps of Engineers jurisdictional resources and 7.2 acres of DFG jurisdictional resources would be affected during construction); paleontological resources (project site potentially overlays undiscovered paleontological resources, which could be uncovered during construction); and transportation and circulation (increase in traffic in the area during construction) (BLM and County of Imperial 2010b).

4.2.9 Imperial Valley Solar Company 1 Photovoltaic Solar Facility

4.2.9.1 Project Description

Imperial Valley Solar Company 1, LLC (Applicant) proposes to develop a 23 MW alternating current PV energy facility on a 123-acre site currently owned by IID. Annually, this project is expected to generate approximately 46,000 MW-hours of electricity, which would be delivered by a 2,400-foot-long, 13.2-kilovolt, overhead transmission line to the existing IID Niland Substation located approximately 20 feet from the southwestern boundary of the project site. Construction of this project is expected to last 6 months. Per a long-term power purchase agreement, IID would purchase all of this project's output. This project would be located in an unincorporated area of Imperial County east of Niland, west of Cuff Road, and east of Wilkins Road (County of Imperial 2010b).

4.2.9.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

An MND was prepared for Imperial County Planning and Development Services Department in September 2010. Environmental impacts discussed in the MND include impacts on archaeological/historical resources and wildlife, but by implementing the proposed mitigation measures, these impacts would be reduced to less-than-significant levels. Specifically, impacts on biological resources would include impacts on burrowing owls and their associated habitat, and impacts on archaeological/historical resources would include the presence of one prehistoric archaeological resource within the project area that is potentially eligible for the California Register of Historic Resources (County of Imperial 2010b).

4.2.10 Imperial Valley Solar, LLC Project (formerly SES Solar Two) and Amendment to the California Desert Conservation Area Land Use Management Plan

4.2.10.1 Project Description

In June 2008, Stirling Energy System submitted an Application for Certification to the CEC for the construction of a 750 MW solar energy facility on an approximately 6,500-acre project site in Imperial County. The site is 14 miles west of El Centro and 4 miles east of Ocotillo. Approximately 30,000 25-kilowatt solar dish Stirling systems and associated infrastructure comprise the primary equipment for the generating facility. In the approximate center of the site, a new 230-kilovolt substation would be constructed and connect to the San Diego Gas and Electric Imperial Valley Substation via a 10.3-mile-long, double-circuit, 230-kilovolt transmission line. In addition, a water supply pipeline would be constructed to transport water to the project site from an off-site water treatment plant near the unincorporated area of Imperial County known as Seeley. Construction of the approved 709 MW project would begin in 2011 and would take approximately 40 months to complete. However, as each 60-unit group of Stirling Energy Systems engine modules is completed, power would be available to the electricity grid.

4.2.10.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

The BLM published a Notice of Intent for this project on October 17, 2008, the CEC found the Application for Certification data adequate on October 8, 2009, and BLM published a Notice of Availability of the Draft EIS on February 12, 2010, and a Notice of Availability of the Final EIS on July 28, 2010. The CEC approved the Application for Certification on September 29, 2010, and BLM issued a Record of Decision on October 5, 2010. The Imperial Valley Solar (IVS) project would result in a variety of unavoidable adverse environmental impacts, even after mitigations are implemented. These impact areas would include biological resources (flat-tailed horned lizard), cultural resources, land use (loss of recreational land/open space), recreation, and visual resources (conversion of natural desert landscape to an industrial landscape). Impacts mitigated to less-than-significant levels would include impacts on biological resources, paleontological resources, noise, hydrology, water use (implementation of the Seeley Waste Water Treatment Plant [SWWTP] upgrades would reduce water use impacts), and water quality (BLM 2010a).

The IVS project plans to obtain its water supply for construction and operations from the SWWTP, which is currently undergoing the EIR process through Imperial County for an upgrade to the plant to ensure that it can meet the long-term needs of the IVS project. According to the IVS Final EIS, upgrades to the SWWTP would not be completed in time for the construction of the IVS project. Therefore, Dan Boyer Water Company in Ocotillo would provide water for the first six months of construction, but not to exceed 36 months. Upon completion of the SWWTP upgrades, an average of 33,550 gallons per day (gpd), and a maximum of 200,000 gpd would be transferred to the IVS project, which corresponds to approximately 0.05 and 0.31 cubic foot per second (cfs), respectively. This rerouted water would normally be discharged from the SWWTP to the New River, which eventually discharges to the Salton Sea. The IVS Final EIS states that, “A reduction of 0.05 to 0.31 cfs to the New River discharge is 0.03 to 0.16 percent of the total [discharge] and would not have a material effect on water quantity of the river” (BLM 2010a , pg. 4.17-25).

4.2.11 Metropolitan Water District of Southern California's New and Alamo Rivers Water Rights Applications

4.2.11.1 Project Description

On November 7, 1997, Metropolitan Water District of Southern California (Metropolitan) filed Application 30661 with the State Water Resources Control Board (SWRCB), requesting a permit to divert water from the Alamo River and unnamed drains tributary to the Alamo River. The application requests a maximum direct diversion of 800 cfs and a maximum annual use of 475,000 acre-feet. The purposes of use specified in the application include municipal, industrial, irrigation, and fish and wildlife protection and/or enhancement. This application is still pending with the SWRCB (DWR and DFG 2007).

Metropolitan prepared an analysis of the availability of unappropriated water from the Alamo River and unnamed drains tributary to the Alamo River in 2004 (Metropolitan 2004, as cited in DWR and DFG 2007). The report identified two alternative ways for Metropolitan to use the water. One alternative would include an exchange of Colorado River water for Alamo River water with Coachella Valley Water District (CVWD). The second alternative would provide delivery of the water to the Colorado River Aqueduct for use by Metropolitan. Under both alternatives, the water would need to be treated by desalination prior to use (DWR and DFG 2007).

On September 23, 2004, Metropolitan filed Application 31431 with the SWRCB, requesting a permit to divert water from the New River and irrigation drains tributary to the New River. The application requests a maximum direct diversion of 700 cfs and a maximum annual use of 433,400 acre-feet. This application is still pending with the SWRCB (DWR and DFG 2007).

This project would consist of construction of diversion works on the New River, desalination and treatment facilities, and a conveyance system to deliver the water. The first option for delivery of treated water would be through a conveyance system directly to the Colorado River Aqueduct or to IID and CVWD through the Coachella Canal and other local irrigation works. Under the second delivery option, IID and/or the CVWD would exchange an equivalent amount of their Colorado River water for the desalted New River water (DWR and DFG 2007).

4.2.11.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

Environmental documents for this project have not been completed to date. Diversion of water from the New and Alamo rivers has the potential to result in both temporary construction-related impacts and long-term impacts. Temporary impacts could include impacts on biological resources, cultural resources, and water resources due to construction of treatment and desalination plants and related conveyance facilities. Long-term impacts would include reduction in flows in the New and Alamo rivers, water quality impacts in the New and Alamo rivers, reduced inflows to the Salton Sea, and impacts on water quality in the Salton Sea. Long-term impacts could also include impacts on biological resources in both the New and Alamo rivers and the Salton Sea due to reduced flow/inflows and changing water quality (DWR and DFG 2007). Quantification Settlement Agreement mitigation water will terminate in 2017, thereby compounding the potential impact of reduced flows pursuant to Metropolitan's extraction of water from the New and Alamo rivers (refer to Section 1 for additional discussion of this agreement).

4.2.12 Seeley County Wastewater Treatment Plant Upgrade Project

4.2.12.1 Project Description

The Seeley County Wastewater Treatment Plant Upgrade Project would consist of an upgrade to an existing wastewater treatment facility immediately east of the New River along the western boundary of the unincorporated community of Seeley in Imperial County. The upgrade would ensure that the new

wastewater treatment plant is in compliance with Title 22 standards; specifically, the effluent would be suitable for unrestricted recycled uses and for discharge into the New River. The treatment plant's current capacity is 250,000 gpd, and in 2008, discharged approximately 112,000 gpd into the New River. The plant currently has a 2-acre primary treatment pond, two 0.12-acre "reactor" ponds, and three 0.14-acre sedimentation ponds. The proposed plant upgrades include modifying two existing treatment ponds to allow an extended aeration activated sludge process, adding microfiltration and ultraviolet disinfection, converting two existing treatment ponds to in-ground earthen basins with the capacity to store up to 300,000 gallons of Title 22 recycled water, installing a new backup generator, and installing and upgrading existing underground piping (Seeley County Water District 2010).

4.2.12.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

Environmental documents for this project have not been completed to date. According to Seeley County Water District (2010), probable environmental impacts would most likely be in the areas of water quality, biology, air quality, noise, and growth inducement. Specifically, "The EIR...will address impacts of ceasing discharge through the unlined channel to the New River (pg. 3)." As mentioned above in the discussion of the IVS Project, the upgrades to this wastewater treatment plant would provide up to 200,000 gpd to the IVS Project. This diverted water would otherwise be discharged into the New River and eventually flow to the Salton Sea.

4.2.13 Travertine Point Specific Plan

4.2.13.1 Project Description

Black Emerald, LLC (Applicant) proposed the Travertine Point Specific Plan (Travertine Point), which was prepared in consultation with the Torres Martinez Desert Cahuilla Indian Tribe. Travertine Point would master plan a mixed-use community on both tribal and nontribal lands within the specific plan area on the Salton Sea's northwestern shore, south of the community of Oasis, and northeast of Anza-Borrego Desert State Park. The proposed specific plan area is 4,918 acres, 3,508 acres of which is nontribal land. 3,938 acres of land is located in Riverside County and 980 acres of land is located in Imperial County. Travertine Point would include four districts, with the following land uses: a town center, a marina, a resort/casino, a cultural preserve and living desert, residential neighborhoods, regional and local commercial retail, 1,525 acres of open space and recreational areas, schools, and public services and facilities. Project construction is expected to take place in a time span of 35 years, with initial development commencing in 2016 (Riverside County Planning Department 2010).

4.2.13.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

The Riverside County Planning Department prepared a Revised Draft EIR in November 2010. The Travertine Point Specific Plan project would result in a variety of significant and unavoidable impacts, even after mitigations are implemented. These impacts would include aesthetics (impacts on views from the Salton Sea, Travertine Rock, and the Santa Rosa and San Jacinto Mountains National Monument; damage to the existing visual character of the site, if deemed to be of value; an increase in light and glare compared to current conditions; and existing residences would experience an increase in nighttime lighting and glare); agricultural resources (a loss of 1,559 acres of Prime Farmland, 1,553 acres of Unique Farmland, and 362 acres of Farmland of Local Importance would be incurred); air quality (construction and operations would exceed thresholds for volatile organic compounds, NO_x, carbon monoxide, PM_{10}, and $PM_{2.5}$; project would conflict with implementation of South Coast Air Quality Management District's and Imperial County Air Pollution Control District's (ICAPCD's) air quality management plans; sensitive populations residing at project site could experience more serious adverse health impacts due to long-term high levels of ozone (O_3), volatile organic compounds, PM_{10}, and $PM_{2.5}$; expose workers to fugitive dust [valley fever and Hantavirus]; operations would generate more diesel-fueled truck trips leading to

emissions of diesel particulate matter; and the Salton Sea would be a source of adverse odors during project operations); cultural resources (operations would lead to increased human intrusion into areas containing cultural resources); greenhouse gases (GHGs) (at buildout, the project would increase the amount of emissions from the existing baseline by over 237,000 metric tons of carbon dioxide equivalents per year; and the project would potentially impede California's ability to comply with Assembly Bill 32 and with the region's ability to meet the regional land use planning GHG reduction targets under Senate Bill 375); land use and planning (project would induce an incremental loss of open space in Riverside and Imperial counties); noise (off-site roadways would experience noise level increases above five A-weighted decibels; and construction equipment operation near sensitive receptors could result in vibration levels above 0.01 inch/second [including at on-site receptors that were constructed during earlier project construction phases]); public services – parks and recreation (indirect impacts to off-site areas from the intrusion of humans, pets, and motorized vehicles in sensitive areas); and transportation/traffic (during phased construction, some intersections could operate at unacceptable levels of service). Impacts mitigated to less-than-significant levels would include impacts on biological resources, geology and soils, hazards and hazardous materials, population and housing, public services (fire protection, law enforcement, education, libraries, and medical services), and utilities (Riverside County Planning Department 2010).

4.2.14 Truckhaven Geothermal Leasing Area

4.2.14.1 Project Description

Truckhaven Geothermal Leasing Area encompasses a total of 14,731 acres in western Imperial County, north of State Route 78, west of State Route 86, south of County Highway S-22, east of Anza Borrego Desert State Park, and overlaps portions of Ocotillo Wells State Vehicular Recreation Area (BLM 2007). The action associated with this project is the decision of whether or not BLM-managed lands within Truckhaven Geothermal Leasing Area should be leased for geothermal development.

4.2.14.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

After review of a Final EIS, BLM issued a Record of Decision to lease all BLM-managed lands, totaling 14,731 acres, within Truckhaven Geothermal Leasing Area (BLM 2008). The issuance of geothermal leases has no direct impacts because it does not grant the lessee the right to explore for or develop geothermal resources if such activates require surface disturbance or other extensive operations. However, indirect environmental impacts are assumed as leasing represents that exploration, development, and production of geothermal resources would occur at some point in the near future. As such, before any lessee conducts exploration or development of geothermal resources within the BLM-managed Truckhaven Geothermal leasing Area, a separate NEPA process would be required for this project in question (BLM 2008).

Indirect environmental impacts associated with Truckhaven Geothermal Leasing Area would include impacts on air quality (particulates from land disturbance, unpaved access roads, and construction diesel engine exhaust would increase); archaeology/cultural resources (33 currently recorded sites within the project area, including some of the largest Lake Cahuilla habitation sites in the area); fish and wildlife (adversely affecting wildlife populations and species/natural community/habitat recognized for importance; impeding wildlife/avian migration routes; and preventing natural community reestablishment); human health and safety/hazardous materials (hazardous materials use during exploration, construction, operations; increased traffic; and project parcels are located in a Navy fly zone); recreation (reduction of opportunities to off-highway vehicles); special-status species (10 special-status plants, flat-tailed horned lizard, and California desert fringe-toed lizard); topography, geology, and geological hazards (502 acres of initial disturbance and 405 acres of final land disturbance); vegetation (construction-related contaminants on soil or in runoff could inhibit plant growth; loss of plant habitats;

plant community fragmentation; and introduction of invasive species would be possible); and visual resources (two geothermal plants, wells, steam from water cooling, and transmission lines could all have negative impacts on the aesthetic character of the area) (BLM 2008).

4.2.15 West Chocolate Mountains Renewable Energy Evaluation Area

4.2.15.1 Project Description

This action would assess whether West Chocolate Mountains Renewable Energy Evaluation Area, an area of land 21,300 acres in size and managed by the BLM, should be made available for renewable energy development, specifically, for geothermal leasing, solar energy rights-of-way, and wind energy rights-of-way. The project area is bordered by Imperial Sand Dunes Recreation Area on the south, the Imperial Valley agricultural belt on the west, the Imperial/Riverside County line on the north, and Chocolate Mountains Aerial Bombing and Gunnery Range on the east (BLM 2010b).

4.2.15.2 Project Environmental Analysis Status and Anticipated Environmental Impacts

The BLM prepared a Notice of Intent to prepare an EIS on February 10, 2010, and the Draft EIS and California Desert Conservation Area Plan (CDCAP) Amendment was released in June 2011 (BLM 2011). The CDCAP Amendment assesses whether renewable energy development should be allowed within the West Chocolate Mountains Area. Impacts from the various types of development could include moderate, and adverse air quality impacts during construction and operation from fugitive dust, PM_{10}, carbon monoxide, and ozone precursors emissions. These emissions may contribute to ongoing exceedances of National Ambient Air Quality Standards, but could be offset by a reduction in air pollutants caused by fossil fuel-burning power plants. Impacts on cultural and paleontological resources could include the degradation of important resources/significant paleontological resources, disturbance of human remains, changes in the significance of a historical resource, and introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features. Impacts on visual resources could include the introduction of contrast to the environment. The project also could result in a disproportionate share of adverse impacts on certain racial, ethnic, or socioeconomic groups. The potential impacts associated with the West Chocolate Mountains Renewable Energy Evaluation Area project would be greatest under the full renewable energy development alternative. However, the majority of impacts would be reduced or avoided with the implementation of mitigation measures.

4.2.16 Summary of Cumulative Project Impacts

The potential impacts of the projects discussed above are summarized in Table 4-1. Although an environmental document has not yet been completed for some of these projects, the table assumes that potentially significant impacts could result, based on the list of potential environmental issues to be addressed for that project, even if feasible mitigation measures may be available to reduce impacts on less than significant. The Corps 404 permits are not included in the table because as discussed above, the Corps has found that issuance of such permits has resulted in minimal impacts because adequate compensatory mitigation was required.

Table 4-1 Related Projects Impact Summary

Impact Areas	Related Projects													
	Allied Imperial Landfill Expansion	Black Rock 1, 2, and 3 Geothermal Power	Chocolate Mountains Solar Farm[1]	Desert Springs Resort Specific Plan	East Brawley Geothermal Development	Imperial Solar Energy Center South	Imperial Solar Energy Center West	Imperial Valley Solar Company PV Solar	Imperial Valley Solar, LLC Project	Metropolitan New & Alamo Rivers Water Rights Applications[2]	Seeley County WTP Upgrade	Travertine Point Specific Plan	Truckhaven Geothermal Leasing Area[3]	West Chocolate Mtns. Renewable Energy Area[4]
Aesthetics	S				PS				U			U	PS	S
Agricultural Resources				S		S	S					U		
Air Quality	S	S		S	PS	S	S				PS	U	PS	S
Biological Resources	S			S	PS		S	S	U	PS	PS	S	PS	S
Cultural Resources	S			S	PS	S	S	S	U			U	PS	S
Energy Consumption														
Environmental Justice														
Geology and Soils		S		S	PS	S	S					S	PS	S
Greenhouse Gas Emissions												U		
Hazards and Hazardous Materials	S			S	PS	S	S							S
Hydrology and Water Quality				S	PS		S		S	PS	PS			S
Indian Trust Assets														
Land Use					PS				S			U		PS
Noise	S			S					S		PS	U		S
Paleontological Resources					PS	S	S		S					S
Population and Housing														
Public Services	S				PS							S		

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Impact Areas	Related Projects													
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Recreation									U			U	PS	
Socioeconomics														
Transportation	S			S		S	S					U		S
Utilities and Service Systems														

Symbols S: Impacts would be mitigated to a Less-than-Significant level
U: Impacts would be Significant and Unavoidable
PS: Impacts could be potentially significant, although feasible mitigation measures may be identified to reduce impacts

Notes:

1: A Mitigated Negative Declaration prepared for the project did not identify significant effects.

2, 3: Because no environmental document has been completed for the project, it is assumed that potentially significant impacts could result.

4: NEPA does not require the characterization of an impact's significance, but for purposes of this analysis, those impacts requiring mitigation are classified as significant ("S").

4.3 ANALYSIS OF CUMULATIVE IMPACTS BY RESOURCE

This section summarizes the potential cumulative impacts, organized by resource area, which would result from the implementation of the SCH Project alternatives and the related projects described above. Mitigation measures to reduce significant cumulative impacts are identified as appropriate.

4.3.1 Aesthetics

The geographic scope for the aesthetics cumulative impact analysis is limited to the area shown in Figure 4-1, with particular emphasis on the area around the Salton Sea. Cumulative impacts on the visual environment associated with construction of the projects discussed above along with any of the SCH Project alternatives would be less than significant, since these projects would be constructed at various locations around the Salton Sea and Imperial Valley, and aesthetic impacts would be short-term and localized. Operation and maintenance of the projects described above would result in changes to the visual environment through the introduction of buildings and infrastructure and the associated loss of open space. Implementation of one of the SCH Project alternatives would result in beneficial aesthetic impacts related to change in the visual character of the area occupied by the SCH ponds. Therefore, implementation of any of the SCH Project alternatives would not contribute to any adverse impacts, and no long-term adverse cumulative aesthetic impacts would occur.

4.3.2 Agricultural Resources

The geographic scope for the agricultural resources cumulative impact analysis is Imperial County. Construction and operation of the projects described above could result in the loss of several thousand acres of Important Farmland in Imperial County. The cumulative loss of Important Farmland would result in a significant cumulative impact on agricultural resources. Development of the sedimentation basin associated with SCH Project Alternatives 1 and 4 would result in the loss of 60 acres of Important Farmland in Imperial County. The contribution of either of these alternatives to the cumulative impact would not be cumulatively considerable and therefore would not be significant because the small increment that would be lost would be negligible in relation to the overall amount of Important Farmland present in the Imperial Valley (over 500,000 acres).

4.3.3 Air Quality

The geographic scope for the air quality cumulative impact analysis is the portion of the Salton Sea Air Basin under the jurisdiction of the Imperial County Air Pollution Control District. Construction and operation of the projects described above would result in emissions that may not be entirely accounted for in applicable air quality plans and, thus, could conflict with or obstruct the implementation of such plans. SCH Project construction, operation, and maintenance would result in the emission of criteria pollutants and construction would exceed the ICAPD's thresholds for NO_x (all alternatives) and PM_{10} (Alternatives 1, 2, and 3). The cumulative impact for NO_x would be significant for all alternatives, and the Project's contribution would be cumulatively considerable and therefore significant. Feasible mitigation measures for the projects described above would reduce, but not entirely eliminate, the generation of emissions that exceed the cumulative emissions estimates contained in the *Imperial County Attainment Status and Applicable Plans*. As discussed in Section 3.3, implementation of MM AQ-1, implement fugitive PM_{10} control measures, and MM AQ-2, implement diesel control measures, would not reduce the PM_{10} emissions to below the thresholds for Alternatives 1, 2, and 3, and the NO_x emissions would remain significant. Thus, the cumulative impact from NO_x emissions from all alternatives and PM_{10} emissions from Alternatives 1, 2, and 3 would be significant and unavoidable.

Operation of the projects discussed above could result in cumulative violations of Federal and state standards or ICAPCD's thresholds. Emissions from SCH Project operation would be limited to routine

maintenance and associated vehicular traffic, and such emissions would not exceed applicable thresholds. Thus, the SCH Project's contribution to operational emissions would not be cumulatively considerable.

The SWWTP would reduce the discharge to the New River by 0.05 to 0.31 cfs, which is 0.03 to 0.16 percent of the total discharge. This would result in a negligible decrease in the flows to the Salton Sea, and could incrementally expose more playa, increasing the potential for fugitive dust emission. The SCH ponds would cover more playa than would be exposed as a result of any of the alternatives, reducing the potential for fugitive dust emissions. The SCH Project would have a beneficial impact on fugitive dust emissions; therefore, it would not contribute to a cumulatively considerable and significant impact.

4.3.4 Biological Resources

The geographic scope for the biological resources cumulative impact analysis is the area shown on Figure 4-1. As discussed above, the Corps has found that issuance of section 404 permits has resulted in minimal environmental impacts. Such a permit would be required for the SCH Project, but permit conditions (compensatory mitigation) would be required that would ensure that impacts of this project on waters of the U.S. were minimized, as well, and any cumulative impacts from the issuance of such permits would not be significant. Construction, operation, and maintenance of the other projects discussed above could result in significant cumulative impacts on biological resources associated with the loss of habitat and individuals of special-status species, disturbance or loss of riparian or other sensitive habitats, and adverse affects on Federal Waters of the U.S., including wetlands. Although the SCH Project alternatives would have overall beneficial impacts on biological resources, construction, maintenance, and operations would result in significant impacts, as well, and its contribution would be cumulatively considerable. Feasible mitigation measures would reduce potential impacts of other projects, and implementation of MM BIO-1, a desert pupfish relocation plan, MM BIO-2, preconstruction and maintenance surveys, MM BIO-3, noise measurements and as-needed noise attenuation features, and MM BIO-4, a habitat mitigation and restoration plan, would reduce the SCH Project's contribution to cumulative impacts on biological resources to less than significant.

4.3.5 Cultural Resources

The geographic scope for the biological resources cumulative impact analysis is Imperial County. Ground-disturbing activities associated with the projects discussed above could result in adverse impacts on cultural resources, including damage to known or currently unknown archaeological and historical resources, and could result in the inadvertent discovery of human remains. A large area of land surface could be subject to ground disturbance, and the cumulative impacts would be significant. Ground-disturbing activities associated with one of the SCH Project alternatives also could result in damage to currently unknown cultural resources or the inadvertent discovery of human remains. The contribution of the SCH Project to the impacts of other projects would be cumulatively considerable and therefore significant. Implementation of standard mitigation measures for cultural resources would reduce potential impacts of other projects, and implementation of MM CR-1, prepare and implement a survey plan and an inadvertent discovery plan would reduce the contribution of the SCH Project to less than significant.

4.3.6 Energy Consumption

The geographic scope for the energy consumption cumulative impact analysis is Imperial County. Construction, operation, and maintenance of the projects discussed above would result in the consumption of energy, including electricity, natural gas, diesel fuel, and gasoline, but would not necessarily result in the inefficient, wasteful, or unnecessary consumption of energy. Several of the projects discussed above would result in the generation of electrical energy and cumulative impacts would be less than significant. SCH Project operation would require the use of diesel-powered pumps to deliver saline water from the Salton Sea to the SCH ponds. Over time, the efficiency of the saline pump may decrease under long-term

pumping; however, a comparatively minor amount of energy would be required, and the SCH Project's contribution to the cumulative impact would not be considerable and is therefore, less than significant.

4.3.7 Environmental Justice

The geographic scope for the environmental justice cumulative impact analysis is Imperial County. Under CEQA, economic and social impacts are not considered significant effects on the environment. Construction emissions associated with the projects discussed above, along with those of the SCH Project could have a disproportionate impact on minority and low-income populations. The cumulative impact would be significant, and the SCH Project's contribution would be cumulative considerable. All projects would be required to comply with the Imperial County Air Pollution Control District's Regulation VIII, which would reduce fugitive dust and combustive emissions, and implement other feasible mitigation measures. Implementation of MM AQ-1 and MM AQ-2 would reduce the significant fugitive dust (PM_{10}) impacts of the Alternatives 1, 2, and 3 to less than significant, and would reduce, but not eliminate short term NO_x impacts. The cumulative impact, therefore, would be significant and unavoidable.

As discussed in Section 4.3.5 above, both the SCH Project and other projects in the area would have the potential to affect cultural resources, including human remains. This would result in a significant cumulative impact on cultural resources, and the SCH Project's contribution would be considerable and therefore significant. . Implementation of standard mitigation measures for cultural resources would reduce potential impacts of other projects, and implementation of MM CR-1, prepare and implement a survey plan and an inadvertent discovery plan would reduce the contribution of the SCH Project to less than significant.

Construction and operation of the projects described above could result in the permanent conversion of several thousand acres of Important Farmland in Imperial County to nonagricultural use, which could reduce employment opportunities that would disproportionately affect minority and low-income communities in the area around the Salton Sea. The cumulative impacts of these projects would be significant. Development of the sedimentation basin for the SCH Project under Alternatives 1 and 4 would result in the permanent conversion of 60 acres of Important Farmland in Imperial County to non-agricultural use. The Project's contribution to this impact would not be cumulatively considerable for these alternatives given the small amount of land that would be used in relation to land in production (over 500,000 acres).

4.3.8 Geology and Soils

The geographic scope for the geology and soils cumulative impact analysis is the area surrounding the SCH Project alternative sites and the local source for rock and gravel. Impacts related to geology and soils would be highly localized, and the SCH Project alternatives would not result in a cumulative impact in combination with other projects. The SCH Project would require the use of rock as a construction material, and although other projects may also require such use, rock is a readily available resource, and the cumulative impact would be less than significant.

4.3.9 Greenhouse Gas Emissions/Climate Change

The geographic scope for the greenhouse gas emissions/climate change cumulative impact analysis is the entire world, because changes occur on a global level. Impacts on climate change must take into account global emissions, because climate change does not result from localized emissions. Construction and operation of the SCH Project alternatives and the other projects described above would result in GHG emissions, but the incremental increase would be negligible in relationship to total emissions throughout the world, and the impact would be less than significant.

4.3.10 Hazards and Hazardous Materials

The geographic scope for the hazards and hazardous materials cumulative impact analysis is Imperial County. Construction of the SCH Project alternatives and the projects discussed above could result in the release of hazardous materials, encounter contaminated soils, increase the risk of wildland fires, and temporarily increase traffic along adjacent roads. With adherence to state, Federal, and local requirements, cumulative impacts would be less than significant.

Construction of projects discussed above could result in the release of dust-borne disease causing viruses, as could the SCH Project. Adherence to local regulations for dust suppression would reduce potential impacts, but given the extent of ground disturbance that could occur, significant cumulative impacts could occur, and the SCH Project's contribution would be considerable. The primary persons who would be exposed to borne-borne diseases would be construction workers. Implementation of MM HAZ-1, requiring construction worker training related to soil exposure, would reduce the SCH Project's contribution to a significant cumulative impact to less than significant.

None of the other projects discussed above would have the potential to increase selenium levels in sport fish and waterfowl. Thus, no cumulative impacts would occur.

The Desert Springs Resort would create new year-round water bodies (e.g., water features at golf courses and lakes), which could attract waterfowl to roost and forage, which may increase the risk of birdstrikes with civilian and military aircraft in the area of these new permanent water bodies. However, given the implementation of applicant-proposed mitigation measures, such as bird control measures and the placement of water bodies in relation to the approach and departure paths for Naval Air Facility El Centro, the project was found to be consistent with the Airport Land Use Plan (County of Imperial 2010a). Implementation of the SCH Project alternatives would result in the creation of ponds in the area immediately adjacent to, or within the area currently occupied by the Salton Sea. Thus, the SCH Project would preserve opportunities for waterfowl to roost and forage near the existing deltas of the New and Alamo rivers. Because waterfowl and other birds currently roost, breed, and forage in these areas, SCH Project implementation would not substantially change the location of these activities. SCH Project implementation would also not substantially increase the numbers of waterfowl that utilize the Salton Sea for roosting or foraging. Moreover, the number of birds in the surrounding area will decrease as the salinity level of the Salton Sea increases and as the water surface elevation declines. Given the implementation of the applicant-proposed mitigation measures included as part of the Desert Springs Resort Project and the lack of increased bird populations associated with the SCH Project, cumulative impacts associated with increased risk for birdstrikes with civilian and military aircraft would be less than significant.

4.3.11 Hydrology and Water Quality

The geographic scope for the hydrology and water quality cumulative impact analysis is shown on Figure 4-1. Construction-related impacts on water quality would be temporary and localized and would not contribute to a cumulative impact in combination with other projects.

The hydrology analysis performed for the SCH Project (refer to Section 3.11, Hydrology and Water Quality) already takes into consideration impacts from a number of other projects that would affect the salinity and water surface elevation of the Salton Sea. However, SWWTP would provide up to 200,000 gpd to the IVS Project. This diverted water would otherwise be discharged into the New River and eventually flow to the Salton Sea. Under Alternatives 1, 2, and 3, the SCH Project also would require diversion of the water from New River to fill the SCH ponds. The amount that would be diverted from the New River by the SWWTP Project is minor (0.03 to 0.16 percent of the total discharge). As discussed in Section 3.11, impacts on hydrology and water quality from the SCH Project would be less than

significant, and this minor increase in the amount of water diverted would not change this conclusion. The cumulative impact would be less than significant.

4.3.12 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian tribes or individuals. No ITAs exist in the SCH Project area or nearby vicinity and no impacts on ITAs would occur under any of the SCH Project alternatives. Therefore, no cumulative impacts on ITAs would occur.

4.3.13 Land Use

The geographic scope for the land use cumulative impact analysis is Imperial County. The projects described above would require approvals by Imperial County, who would be responsible for ensuring that the development was consistent with the General Plan. Assuming the implementation of mitigation measures included in this EIS/EIR, the SCH Project would be compatible with the Imperial County General Plan and other applicable land use plans and policies. The Project would be compatible with existing and future land uses planned for the area and would not contribute to a cumulative impact in combination with other projects.

4.3.14 Noise

The geographic scope for the noise cumulative impact analysis is limited to the area within 1 mile of the proposed SCH sites and adjacent to the haul routes. Noise from construction, operations, and maintenance activities at the SCH sites would be localized, and would not contribute to a cumulative impact in combination with other projects described above. Construction truck traffic associated with the projects discussed above and the SCH Project would travel local roads and would cause a temporary increase in noise, which at some locations would be in proximity to residents. Because the projects are located at dispersed locations around the Salton Sea and as it is unlikely that many of the projects would be constructed at same time, the routes used by construction trucks would vary, and even during periods of heaviest construction activities (e.g., during delivery of materials), trucks would not constantly pass residential receptors. Since it takes a doubling of vehicular traffic to increase noise levels by 3 dBA, the addition of truck trips from construction of the projects would not cause a perceptible increase in noise along local roads, and cumulative impacts would be less than significant.

4.3.15 Paleontological Resources

The geographic scope for the paleontological resources cumulative impact analysis is Imperial County. Ground-disturbing activities associated with construction, operation, and maintenance of other projects discussed above could expose and damage undiscovered paleontological resources, and given the extent of ground disturbance, significant cumulative impacts on paleontological resources could occur. The SCH Project also would result in ground disturbance, which could expose and damage paleontological resources, and its contribution would be cumulatively considerable and, therefore, significant. Implementation of feasible mitigation measures could reduce potential impacts of the other projects, and implementation of MM PALEO-1, prepare and implement a survey plan and monitoring plan, MM PALEO-2, construction worker training, and MM PALEO-3, prepare and implement a paleontological resource data recovery plan, would reduce potential impacts of the SCH Project to less than significant.

4.3.16 Population and Housing

The geographic scope for the population and housing cumulative impact analysis is Imperial County. Construction, operation, and maintenance of the projects discussed above would result in increased employment in the Salton Sea area, which could increase the local population and demand for housing or

displace existing housing or population. However, the potential increase in employment and local housing or demand for new housing would not be substantial in relation to existing employment levels or housing supply. None of the SCH Project alternatives would displace substantial population or housing. The SCH Project would result in increased employment during construction; however, it is assumed that most construction workers would be local, and a short-term influx of a small number of workers and their families would not affect long-term population or housing demand. Operation of the SCH ponds would create several jobs, which would have a negligible effect on population levels or housing demand. Cumulative population and housing impacts would be less than significant.

4.3.17 Public Services

The geographic scope for the public services cumulative impact analysis is Imperial County. Most of the projects discussed would have a minor affect on the demand for emergency services (including police, fire, and trauma centers), although the Desert Springs Resort would result in an increased demand for fire protection. SCH Project implementation would also increase demand for emergency services (police, fire, and trauma centers) associated with increases in employment and recreational visitors. The increased demand associated with the SCH Project is not expected to affect the ability of providers to maintain their current level of service or require new or altered facilities, and the cumulative on public services would be less than significant.

4.3.18 Recreation

The geographic scope for the recreational resources cumulative impact analysis is Imperial County. Implementation of the projects discussed above could affect existing recreational opportunities (e.g., from the loss of open space) and increase demand for recreational facilities associated with increases in local population. Implementation of a SCH Project alternative would create recreational opportunities at the SCH ponds, which would be a beneficial impact. Thus, the SCH Project would not contribute to any adverse cumulative recreational impacts.

4.3.19 Socioeconomics

The geographic scope for the socioeconomics cumulative impact analysis is Imperial County. Construction and operation of the projects discussed above, along with the SCH Project, would cause an increase in local employment and an increase in tax revenue and local business revenue. These increases would result in beneficial cumulative impacts that result from worker spending and the purchases of materials and equipment.

Operation of some of the projects discussed above would reduce recreational opportunities, due to a loss of open space. Operation of the SCH ponds would increase opportunities for passive recreational activity and research, which would be a beneficial impact. Thus, the SCH Project would not contribute to any loss of recreational opportunities, and no cumulative impacts would occur.

SCH pond creation would preclude the reclamation of exposed playa for agricultural use. The hydrology analysis performed for the SCH Project (refer to Section 3.11, Hydrology and Water Quality) already takes into consideration impacts from other projects that would affect the water surface elevation of the Salton Sea. None of the other projects discussed above would affect the water surface elevation of the Sea; therefore, no impacts on exposed playa would occur beyond those identified in Section 3.19, and no cumulative impacts would occur.

Implementation of some of the projects discussed above could result in reductions in agricultural revenues, due to the permanent loss of agricultural lands or short-term losses due to construction or maintenance activities. The SCH Project would result in the loss of agricultural revenue due to removal of

agricultural land at the site of sedimentation basin under Alternatives 1 and 4, construction and maintenance activities in the water pipeline right-of-way, and temporary disruption of agricultural drains and canals during construction of pipelines and the berms around the ponds, but landowners would be appropriately compensated and cumulative impacts would not occur.

The SCH Project is not expected to increase the potential for increased crop depredation or crop contamination by bird feces, nor would any of the other projects discussed above . Thus, no cumulative impacts would occur.

4.3.20 Transportation

The geographic scope for the paleontological resources cumulative impact analysis includes the haul routes that would be used by SCH vehicles within Imperial County. Implementation of the projects discussed above would increase traffic during construction and operations, which could reduce the Level of Service of any roadways below the Imperial County's standard (Level of Service C). Feasible mitigation measures may be available to reduce impacts; however, impacts could remain significant at some locations. SCH Project construction, operation, and maintenance would also result in increases in traffic along roadways adjacent to the SCH Project; however, these increases would be localized and the Level of Service along these roadways would not be reduced below Imperial County's standard. Therefore, the SCH Project's contribution to traffic conditions would not be cumulatively considerable, and its impact would be less than significant.

Construction equipment and trucks used during construction, operation, and maintenance of the projects discussed above, along with one of the SCH Project alternatives, would utilize roadways that are also used by farm equipment. With implementation of standard construction techniques (e.g., signage, flag carriers, and temporary road closures) the presence of construction equipment and trucks on roads used by farm equipment would not pose a substantial safety hazard. In addition, the presence of trucks and equipment would occur in the areas adjacent to each individual project location and the number of vehicles used during operations and maintenance activities would be relatively small. Cumulative impacts would be less than significant.

Construction equipment and trucks used during construction, operation, and maintenance of the projects discussed above, along with one of the SCH Project alternatives, would utilize roadways that are also used by emergency vehicles. During construction, implementation of standard construction techniques (e.g., signage, flag carriers, and temporary road closures) would assure that emergency vehicles would continue to have access to any roadways affected by construction. Increases in traffic associated with operations and maintenance would not preclude access by emergency vehicles, and impacts would be less than significant.

4.3.21 Utilities and Service Systems

The geographic scope for the utilities and service systems cumulative impact analysis is Imperial County. Construction, operation, and maintenance of the projects discussed above, along with the SCH Project, would generate demand for water. It is anticipated that water required during construction (e.g., for dust control) would be provided by water trucked from existing service locations and demand for such water would cease at the end of construction. SCH Project operation would require water for the permanent employees, which would contribute a negligible increase in water demand. The SCH Project's contribution to cumulative impacts for water demand would not be cumulatively considerable.

Construction, operation, and maintenance of the projects discussed above, along with the SCH Project, would generate solid waste, which would be disposed of in local landfills. Sufficient capacity exists in

currently permitted landfills to accommodate additional solid waste, and cumulative impacts would be less than significant.

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SECTION 5

Other Sections Required by NEPA and/or CEQA

5.1 GROWTH-INDUCING IMPACTS

The National Environmental Policy Act (NEPA) requires an Environmental Impact Statement (EIS) to examine the potential of the proposed project to significantly or adversely affect the environment; potential impacts could be either direct or indirect. Indirect effects (NEPA, 40 Code of Federal Regulations [CFR] section 1508.8[b]) may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air, water, and other natural systems including ecosystems.

The California Environmental Quality Act (CEQA) Guidelines require an Environmental Impact Report (EIR) to discuss the ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. This includes ways in which the proposed Project would remove obstacles to population growth or trigger the construction of new community services facilities that could cause significant effects (CEQA Guidelines, section 15126.2).

To address this issue, potential growth-inducing effects are examined through the following considerations:

- Removal of obstacles to growth (e.g., through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development);
- Expansion requirements for one or more public services to maintain desired levels of service as a result of the proposed Project or alternatives;
- Facilitation of economic effects that could result in other activities that could significantly affect the environment; and/or
- Setting a precedent that could encourage and facilitate other activities that could significantly affect the environment.

Growth-inducing effects are not to be construed as necessarily beneficial, detrimental, or of little significance to the environment. This issue is presented to provide additional information on ways in which the SCH Project could contribute to significant changes in the environment, beyond the direct consequences of developing the land use concept examined in the preceding sections of this EIS/EIR. The following analysis focuses on whether the SCH Project would directly or indirectly stimulate or accommodate growth in the surrounding area.

The proposed SCH Project would provide replacement habitat that would offset some of the near-term habitat losses that are expected to occur as surface water levels at the Salton Sea decline and salinity increases, which will reduce the ecological productivity of the Sea. The creation of this habitat would not

removal any obstacles to growth, result in the extension of major infrastructure facilities, or result in any changes in existing regulations pertaining to land development in the area around the Salton Sea.

The SCH ponds would be located in an area that is within the current boundary of the Sea, but which will become exposed playa as the shoreline recedes. The installation of the SCH ponds at this location would preclude the reclamation of this area for other uses, which could include agricultural uses.

Implementation of the SCH Project would not result in any significant impacts on public services (e.g., police fire, or trauma centers) and thus no expansion of public services would be required to maintain desired levels of service as a result of the Project. The creation of replacement habitat by the SCH Project would not set a precedent that could encourage and facilitate other activities that could significantly affect the environment.

The construction of the SCH Project would result in short-term increases in local employment, which would cease at the end of construction. Operation of the project would increase local employment by two persons, which would have a negligible effect on the local economy. The operation of the SCH ponds would increase opportunities for passive recreation (e.g., bird watching), but the ponds are not specifically designed to encourage or facilitate such activities, and increases in passive recreation use at the SCH ponds may offset existing recreational uses at other locations that could decline as the Salton Sea recedes. Thus, the Project would not facilitate any economic effects that would result in other activities that could significantly affect the environment.

In summary, the SCH Project would not foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the area around the Salton Sea in Imperial and Riverside counties.

5.2 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

NEPA requires than an EIS define the balance or trade-off between short-term uses and long-term productivity in relation to the proposed activity (40 CFR section 1502.16).

The SCH Project involves tradeoffs between long-term productivity and short-term uses of the environment. Construction activities would result in a number of short-term impacts that would cease upon completion of construction activities. These include air quality impacts from increased emissions of criteria pollutants; biological impacts from loss of habitat and special-status species, disturbance or loss of riparian or other sensitive habitats, and adverse effects on Waters of the United States; cultural and paleontological resource impacts associated with potential for exposure of and damage to such resources from ground-disturbing activities; hazard impacts associated with the release of air and dust-borne disease causing viruses during ground-disturbing activities; and environmental justice impacts from construction emissions that would have a disproportionate impact on minority and low-income populations. All of these short-term impacts would be mitigated to a level of less than significant with the exception of construction-related impacts on air quality and the associated environmental justice impacts associated with the construction emissions.

The SCH Project proposes the long-term use of land along the current shoreline of the Salton Sea to provide replacement habitat that will be lost as salinity increases and the Salton Sea recedes as a result of reduced inflows. Initially, the SCH ponds would be operated as a “proof-of-concept” project until approximately 2025, with a potential range of operational parameters (related to salinity and water residence times) to determine the optimal habitat conditions that maximize the habitat values of the ponds. After that period, the SCH ponds would be operated to maximize the habitat values of the ponds,

which would partially offset the loss of habitat that results from the decline in the surface level and increase in salinity of the Salton Sea. Thus, the long-term productivity of the land area occupied by the SCH Project would relate to ecological productivity of the replacement habitat, which would include the fish raised in the ponds and the piscivorous (fish-eating) birds that used the ponds as a source of food.

5.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Section 15126.2(c) of the CEQA Guidelines requires that an EIR address any significant irreversible environmental changes that would be involved should the project be implemented, when the project also is subject to NEPA. Resources that are committed irreversibly or irretrievably are those that cannot be recovered if the project is implemented. The SCH Project would involve the irreversible and irretrievable commitment of two types of resources: (1) general industrial resources including energy and fuels, and construction materials; and (2) project-specific resources such as water resources and land uses at the affected sites.

Fossil fuels and energy would be consumed during construction and operation activities. Fossil fuels (diesel oil and gasoline) would be used for construction equipment and vehicles. Electricity would be used to operate pumps that deliver water to the ponds or circulate water between ponds. Use of these energy resources would be irretrievable and irreversible. As discussed in Section 3.6, Energy Consumption, these resources are locally and regionally available and their use would not result any adverse effects on the availability of these resources.

Construction materials such as rock riprap and gravel would be required for the Project and would also be irretrievably committed. As discussed in Section 3.8, Geology and Soils, these materials are regionally available and their use during construction would not result in any adverse effects on the availability of these resources.

Construction and operation of the SCH project would involve the commitment of water resources, which would be irretrievable and irreversible. Water would be used during construction for dust control, and during operations water would be diverted from the New or Alamo rivers to the SCH ponds and then would be discharged to the Salton Sea. As discussed in Section 3.11, Hydrology and Water Quality, the temporary impoundment of water in the SCH ponds would result in evaporation within the ponds, and over time this evaporation would contribute to a decline in the surface level in the Sea. Water resources are locally available, although regional availability of water resources is limited. The use of water resources by the SCH Project to provide replacement habitat could locally limit the availability of water resources for other uses.

The land area that would be used by the SCH Project includes undeveloped lands along the current shoreline of the Salton Sea, including lands that are currently inundated by the Sea, and could include lands currently used for agriculture (if the selected alternative includes a gravity diversion from the New and/or Alamo rivers). The land area currently within the existing footprint of the Salton Sea provides habitat for fish and birds and with implementation of the SCH Project, this area would continue to provide similar habitat. However, as the Salton Sea recedes, without the SCH Project this area would become exposed playa, which could be used for other purposes, including agricultural uses. The use of this land to provide habitat for the SCH Project would be irretrievable and irreversible for the duration of the Project (approximately 75 years). The amount of exposed playa that would be occupied by the SCH ponds would be approximately 4 to 8 percent (depending on the alternative selected) of the total amount of exposed playa that would occur as the Salton Sea recedes, and thus the utilization of exposed playa for the SCH Project would not result in an adverse effect on the availability of this land resource. The SCH Project alternatives could also require the utilization of Important Farmland as the site of sedimentation

basin adjacent to the New or Alamo rivers, which would be irretrievable and irreversible for the duration of the Project.

5.4 UNAVOIDABLE SIGNIFICANT IMPACTS

Construction of the SCH Project would exceed the Imperial County Air Pollution Control District's nitrogen oxides (NO_X) (all alternatives) and particulate matter (Alternatives 1 – 3 only) thresholds. Project construction would also result in a cumulatively considerable/significant net increase in NO_X (all alternatives) and particulate matter (Alternatives 1 – 3 only) emissions. This EIS/EIR identifies feasible mitigation measures (MM AQ-1 and MM AQ-2) that would reduce emission levels, but the impact on NO_x would remain significant and unavoidable for all Project alternatives and are significant and unavoidable for fugitive dust for Alternatives 1 – 3. These construction emissions also would have a disproportionate impact on minority and low-income populations that reside in proximity to the Project site.

SECTION 6

Compliance, Consultation, and Coordination

6.1 REGULATORY COMPLIANCE

The major Federal laws, regulations, Executive Orders, State of California laws and regulations, and tribal laws and regulations that apply to the Salton Sea Species Conservation Habitat (SCH) Project are identified below. A number of Federal environmental statutes address environmental protection, compliance, or consultation. In addition, certain environmental requirements have been delegated to state authorities for enforcement and implementation. The SCH Project would conduct its operations in an environmentally safe manner and in compliance with all applicable statutes, regulations, and standards. Although this section does not address pending legislation or future regulations, it is recognized that the regulatory environment is subject to change, and that Project construction and operation must be conducted in compliance with all applicable regulations and standards.

6.1.1 Federal Laws, Regulations, and Executive Orders

6.1.1.1 Clean Water Act of 1977 (33 United States Code Section 1251 et seq.)

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the Waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but this Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1977.

Under the CWA, the United States Environmental Protection Agency (USEPA) has implemented pollution control programs such as setting wastewater standards for industry. USEPA has also set water quality standards for all contaminants in surface waters. The CWA makes it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. Point sources are discrete conveyances such as pipes or human-made ditches. USEPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the United States Army Corps of Engineers (Corps), to issue permits regulating the discharge of dredged or fill materials into the "navigable waters at specified disposal sites." Section 502 of the CWA further defines "navigable waters" as "waters of the United States, including territorial seas." "Waters of the United States" are broadly defined in Code of Federal Regulations (CFR), title 33, section 328.3, subdivision (a), to include navigable waters, perennial and intermittent streams, lakes, rivers, ponds, as well as wetlands, marshes, and wet meadows.

The CWA section 404(b)(1) Guidelines govern the issuance of permits authorizing the discharge of fill material into waters of the United States, and state that:

> ...no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. (40 CFR section 230.10, subdivision (a))

Under the section 404(b)(1) Guidelines, the applicant must demonstrate avoidance or minimization of impacts on waters of the United States to the maximum extent practicable. Under the above requirements, the Corps can only issue a CWA section 404 permit for the "Least Environmentally Damaging Practicable Alternative." In addition, the Corps is prohibited from issuing a permit that is contrary to the public interest. (33 CFR section 320.4)

The section 404(b)(1) Guidelines also extend additional protection to certain rare and/or sensitive aquatic habitats. These are termed "special aquatic sites," and include six categories: sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle/pool complexes (40 CFR sections 230.40-230.45). For proposed activities involving discharges into special aquatic sites, the Guidelines require consideration of whether the activity is dependent on access or proximity to, or siting within, a special aquatic site in order to fulfill its basic project purpose. If an activity is determined not to be water dependent, the section 404(b)(1) Guidelines establish the following two presumptions (40 CFR section 230.10, subdivision (a)(3)), which the applicant is required to rebut in addition to satisfying the alternatives analysis requirements:

- That practicable alternatives not involving discharges of fill material into special aquatic sites are presumed to be available; and
- That all practicable alternatives to the proposed discharge not involving a discharge into a special aquatic site are presumed to have less adverse impacts on the aquatic ecosystem.

For non-water-dependent projects, the applicant must rebut these presumptions in order to demonstrate compliance with the section 404(b)(1) Guidelines. The SCH Project is water dependent.

A section 401 Water Quality Certification or waiver from the Colorado River Basin Regional Water Quality Control Board (CRBRWQCB) is also necessary for issuance of a Corps permit. Additional water quality permitting requirements may include compliance with the section 402 NPDES General Construction Permit for Storm Water Discharges Associated with Construction Activity (including the development of a Storm Water Pollution Prevention Plan) issued by the State Water Resources Control Board (SWRCB) for projects that will disturb one or more acres.

SCH Project construction would be performed under the California Department of Fish and Game's (DFG's) oversight and would include some actions likely to involve dredging, excavation, or placement of structures in Waters of the United States, including wetlands. The Project's Lead agency is preparing and requesting a section 404 Individual Permit. This permit will address Project-related impacts to the Waters of the United States and provide appropriate mitigation measures to minimize impacts.

The California Natural Resources Agency will submit an application for a section 401 Water Quality Certification from the CRBRWQCB and will also coordinate with the CRBRWQCB for requirements of the NPDES and stormwater program under CWA section 402 prior to Project construction. If deemed necessary, a Notice of Intent will be submitted to the CRBRWQCB to comply with section 402. A Storm Water Pollution Prevention Plan would be prepared to meet the states' requirements of the NPDES stormwater program prior to Project construction.

6.1.1.2 Endangered Species Act of 1973, as Amended (16 United States Code 1531 et seq.)

Passed in 1973, the Endangered Species Act protects threatened and endangered species (and their designated critical habitat), as listed by the United States Fish and Wildlife Service (USFWS), from unauthorized take and directs Federal agencies to ensure that their actions do not jeopardize the continued existence of such species. Section 9 prohibits such take, and defines take as to harm, harass, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct. Whenever actions authorized, funded, or carried out by Federal agencies could adversely affect listed species, the action agency must conduct formal consultation under section 7 and under section 10 when no Federal involvement occurs. Consultation with the USFWS is required to identify endangered or threatened species and their habitats, assess impacts thereon, obtain necessary biological opinions and, if necessary, develop mitigation measures to reduce or eliminate adverse effects of construction or operations.

Section 7 consultation will be required between the Corps and USFWS as part of the section 404 Individual Permit process. Section 7 consultation will be facilitated by preparing and processing a Biological Assessment, which will form the basis of the subsequent USFWS Biological Opinion. The Biological Assessment is anticipated to address the following species: desert pupfish (*Cyprinodon macularius*), flat-tailed horned lizard (*Phrynosoma mcallii*), Yuma clapper rail (*Pallus longirostris yumanensis*), California least tern (*Sternula antillarum browni*), southwestern willow flycatcher (*Empidonax traillii extimus*), and least Bell's vireo (*Vireo bellii pusillus*).

6.1.1.3 Fish and Wildlife Conservation Act of 1980 (16 United States Code 2901)

The Fish and Wildlife Conservation Act of 1980 authorizes financial and technical assistance to states for the development, revision, and implementation of conservation plans and programs for nongame fish and wildlife. It also promotes Federal agencies to use their statutory and administrative authority to conserve and promote the conservation of nongame fish and wildlife and their habitats. In 1988 and 1989, amendments were adopted to direct the Secretary of the Interior to undertake certain activities to research and conserve nongame migratory birds.

The SCH Project would be consistent with this Act because the restoration of habitat would promote the conservation of nongame fish and wildlife species and their habitat. Furthermore, the establishment of land cover types that provide habitat for, and the conservation of, nongame fish, which also provide a food source and habitat for nongame migratory piscivorous bird species, is a central component of the SCH Project.

6.1.1.4 National Wildlife Refuge System Administration Act of 1966 (42 United States Code 668dd), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57)

This Act provides for the administration and management of the national wildlife refuge system, including wildlife refuges, areas for the protection and conservation of fish and wildlife threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas.

The SCH Project would be consistent with this Act because the operation of the SCH ponds would include the restoration of some habitat areas located within the Sonny Bono Salton Sea National Wildlife Refuge (NWR). Without the restoration of habitat as part of the SCH Project, those portions of the existing NWR would become playa as the Salton Sea recedes.

6.1.1.5 Migratory Bird Treaty Act, as amended (16 United States Code 703-711)

The Migratory Bird Treaty Act requires management and protection of migratory birds and, specifically, restricts the killing, taking, collection, and selling or purchasing of native bird species or their parts, nests, or eggs. Certain game bird species are allowed to be hunted for during specific periods determined by Federal and state governments. Specific migratory birds covered under this Act are identified in separate agreements between the United States and Great Britain, Mexico, and Japan.

The SCH Project would be consistent with the Migratory Bird Treaty Act. The Project's restoration actions would benefit migratory birds by establishing conservation habitat areas for bird species protected by this Act. DFG will consult with USFWS regarding impacts to migratory birds as required by Executive Order (EO) 13186 (discussed below). Mitigation Measures (MMs) BIO-2 and BIO-4 would be implemented to ensure that the SCH Project would not entail the taking, killing, or possession of any migratory birds or waterfowl subject to this Act or result in an adverse impact to their associated habitat.

6.1.1.6 Migratory Bird Conservation Act of 1929 (16 United States Code 715)

The Migratory Bird Conservation Act of 1929 protects migratory birds by creating the Migratory Bird Conservation Commission. The Commission's purpose is to consider and approve the purchase, rental, or other acquisition of any areas of land or water that may be recommended by the Secretary of the Interior for the purposes of establishing sanctuaries for migratory birds.

No action is required under this Act. However, the SCH Project would be consistent with this Act's goals by providing conservation habitat for migratory piscivorous bird species.

6.1.1.7 Bald Eagle Protection Act of 1940 (16 United States Code 4901-4918)

The Bald Eagle Protection Act imposes criminal and civil penalties on anyone in the United States or within its jurisdiction who, unless excepted, takes, possesses, sells, purchases, barters, offers to sell or purchase or barter, transports, exports or imports at any time or in any manner a bald or golden eagle, alive or dead; or any part, nest or egg of these eagles; or violates any permit or regulations issued under this Act. The Secretary of the Interior may issue regulations authorizing the taking, possession, and transportation of these eagles for scientific or exhibition purposes, for religious purposes of Native American tribes, or for the protection of wildlife, agricultural, or other interests.

The SCH Project would be consistent with the Bald Eagle Protection Act because the restoration actions would not result in adverse impacts to bald or golden eagles.

6.1.1.8 Clean Air Act of 1970, as amended 1977 and 1990 (42 United States Code Section 7401 et seq. and 40 Code of Federal Regulations Parts 50 through 99)

The Clean Air Act's primary objective is to establish Federal standards (National Ambient Air Quality Standards [NAAQS]) for various pollutants from both stationary and mobile sources and to provide for the regulation of polluting emissions via State Implementation Plans (SIPs). The ambient air quality standards are intended to protect the public health and welfare and specify the concentration of pollutants (with an adequate margin of safety) to which the public may be exposed without adverse health effects.

The NAAQS were established for six major pollutants, termed "criteria" pollutants. Criteria pollutants are defined as those pollutants for which the Federal and state governments have established ambient air quality standards for outdoor concentrations to protect public health. The NAAQS are two tiered: primary, to protect public health; and secondary, to prevent degradation of the environment (e.g., impairment of visibility, damage to vegetation and property, etc.). The six Federal criteria pollutants are

ozone, carbon monoxide, particulate matter (which includes both PM_{10} and $PM_{2.5}$), nitrogen oxides (NO_x), sulfur dioxide, and lead. The USEPA uses ambient air data collected at permanent monitoring stations to classify regions as "attainment" or "nonattainment" depending on whether the regions meet the requirements stated in the primary NAAQS. Additional restrictions as required by USEPA are imposed on nonattainment areas in an effort to reach attainment.

The Clean Air Act Amendments of 1990 identify specific emission reduction goals and require states with nonattainment areas to achieve the NAAQS by developing a SIP. USEPA must approve the SIP and the SIP serves as the state's commitment to actions that will reduce or eliminate air quality problems. An important aspect of the SIP is to designate a planning organization that will promulgate rules and implement strategies to achieve the NAAQS.

Clean Air Act Amendments of 1990 section 176 prohibits Federal agencies from engaging in any activity that does not conform to the most recent USEPA-approved SIP's purposes of attaining and maintaining NAAQS. Federally supported or funded activities must not (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any standard; and (3) delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The SCH Project would not require a major source permit under the National Emission Standards for Hazardous Air Pollutants or New Source Review. In addition, the SCH Project would not have any New Source Performance Standards to meet under the Clean Air Act. In addition, since annualized emissions of nitrogen oxides, volatile organic compounds, and PM_{10} and $PM_{2.5}$ would be below the General Conformity thresholds shown in Table 3.3-11, and daily emissions shown in Table 3.3-12 would not exceed 10 percent of the emission inventory shown in Table 3.3-9 (and thus is not regionally significant), General Conformity would not apply to the SCH Project.

SCH Project construction would result in temporary and intermittent increases in air quality emissions in the Project area. However, these short-term increases cannot be avoided and are necessary to achieve the long-term air quality benefits associated with the Project. Construction emissions would be minimized through the implementation of feasible mitigation measures identified in Section 3.3, Air Quality, and would cease upon completion of construction activities (i.e., although the Project would contribute incrementally to violations of Federal ozone and PM_{10} and $PM_{2.5}$ standards during operation, it would not exceed any regulatory thresholds). Therefore, the SCH Project is in compliance with Clean Air Act Amendments of 1990 section 176.

6.1.1.9 Executive Order 13352, Facilitation of Cooperative Conservation

EO 13352 was issued on August 26, 2004. This EO's purpose is to ensure that the Departments of Interior, Agriculture, Commerce, and Defense, and the USEPA implement laws relating to the environmental and natural resources in a manner that promotes cooperative conservation, with an emphasis on appropriate inclusion of local participation in Federal decision making, in accordance with their respective agency missions, policies, and regulations. Under this EO, cooperative conservation is defined as "actions that relate to use, enhancement, and enjoyment of natural resources, protection of the environment, or both, and that involve collaborative activity among Federal, state, local, and tribal governments, private for-profit and nonprofit institutions, other nongovernmental entities, and individuals." The agencies referenced above are directed under this EO to carry out their efforts in a manner that (1) facilitates cooperative conservation; (2) takes appropriate account of and respects the interests of persons with ownership or other legally recognized interests in land and other natural resources; (3) properly accommodates local participation in Federal decision making; and (4) provides that the programs, projects, and activities are consistent with protecting public health and safety.

The SCH Project would be consistent with the principles of cooperative conservation. The SCH Project has been developed by coordinating Federal, state, local, and other public and private Stakeholders in California with interests in restoring habitat and related resources at the Salton Sea. State and Federal Stakeholders would also be responsible for implementing and funding the SCH Project. The Stakeholders have taken appropriate account of and respect the interests of persons with ownership or other legally recognized interests in land and other natural resources in the SCH ponds vicinity. Siting criteria and mitigation measures identified in this Environmental Impact Statement/Environmental Impact Report (EIS/EIR) would be sufficient to reduce or avoid the SCH Project's potential adverse impacts (with the exception of potential short-term air quality impacts). Lastly, the SCH Project would be implemented in a manner that is consistent with protecting public health and safety.

6.1.1.10 Executive Order 11988, Floodplain Management

EO 11988 states that each Federal agency will avoid development in floodplain areas to the extent practicable, to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to determine whether a proposed action would occur in a floodplain and, if so, to consider alternatives to avoid adverse effects and incompatible development in the floodplain. If development in a floodplain is deemed necessary, the Federal agency must prepare and circulate a notice explaining why the action is proposed for the floodplain area. Agencies are to provide opportunity for early public review of any proposed actions in floodplains.

The SCH Project would be consistent with EO 11988. The Project would minimize development in floodplain areas because the SCH ponds would be located within the Salton Sea's current boundaries, which, by definition, are not considered floodplains. Portions of the Project, including water diversion facilities and sedimentation basins, would be located adjacent to the New and/or Alamo rivers, but these facilities would not increase the risk of flood loss or affect the impact of floods on human safety, health, and welfare. The SCH Project would be consistent with EO 11988's intent because it would restore the natural and beneficial values served by floodplains by restoring native habitat. If the SCH pond berms failed, the impounded water would be released directly to the Salton Sea or onto exposed playa where it would then flow to the Sea, and such failure would not expose people to risk of injury or death. The bottom of the sedimentation basin would be from approximately 15 to 20 feet below the ground surface and, therefore, would not pose a flood hazard.

The SCH Project would include a trailer or similar facility that would serve as office space for the permanent employees. It would be constructed on adjacent ground above the -228-foot elevation, which would be in the Zone A delineated by the Federal Emergency Management Agency. Any facility would be constructed in conformance with Imperial County's floodplain regulations for elevation, flood proofing, and tie-downs (for a trailer). These design features would reduce the flood potential and, therefore, by design avoid any flooding-related impacts.

6.1.1.11 Executive Order 11990, Protection of Wetlands

EO 11990 states that each Federal agency will provide leadership and take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. The EO does not apply to Federal agencies' issuance of permits, licenses, or allocations to private parties for activities involving wetlands on non-Federal property. Federal agencies are to provide opportunity for early public review of any proposed plans or proposals for new construction in wetlands.

The SCH Project includes some actions that would involve dredging, excavation, or placement of structures in Waters of the United States, including wetlands. Such actions would require permits under

CWA section 404. The implementing parties would consult with the Corps to ensure that permitting requirements are met, including due consideration of alternative locations and methods that could accomplish the same objectives. The conservation actions would utilize locations and methods that preserve and enhance the natural and beneficial values of those wetlands. The SCH Project would not conflict with EO 11990 and includes measures to preserve and enhance the natural and beneficial values of wetlands, as directed.

6.1.1.12 Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

EO 12898 mandates that each Federal agency will make achieving environmental justice part of its mission by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Federal agencies are encouraged to include demographic information related to race and income in their analysis of the environmental and economic effects associated with their actions.

Section 3.7, Environmental Justice, identifies environmental justice impacts associated with short-term air quality emissions during construction, exposure and damage to undiscovered prehistoric and historic resources, and inadvertent discovery of human remains. Implementation of MMs AQ-1 and AQ-2 would reduce the fugitive dust (PM_{10}) and nitrogen oxides impacts, but the short-term nitrogen oxides impact would be significant and unavoidable for all alternatives, and the fugitive dust emissions would be significant and unavoidable for Alternatives 1 to 3. Implementation of MM CR-1, prepare and implement a survey plan and an inadvertent discovery plan would reduce impacts on cultural resources to less than significant.

6.1.1.13 Executive Order 12962, Recreational Fisheries

EO 12962 states that each Federal agency will, in cooperation with states and tribes, improve the quantity, function, sustainable productivity, and distribution of the United States' aquatic resources for increased recreational fishing opportunities.

The SCH Project would not adversely impact recreational fisheries. Rather, the SCH Project could create recreational opportunities for fishing at the SCH pond sites. Fish would not be intentionally stocked for the purpose of providing recreational fishing opportunities; however, such opportunities may be provided at the SCH ponds, in particular for tilapia. Fish populations would be monitored as a metric of the SCH Project's success. If populations became well established and appeared to provide fish in excess of what birds were consuming, recreational fishing may be allowed.

6.1.1.14 Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds

EO 13186 is primarily intended to assist Federal agencies in complying with the Migratory Bird Treaty Act and to reduce the risk to Federal agencies associated with unintentional take of migratory birds. It encourages agencies to carry out certain actions, as appropriate and practicable, to promote the conservation of migratory birds, such as restoring and enhancing migratory bird habitat; designing migratory bird habitat conservation measures and practices into agency plans; evaluating impacts of proposed Federal actions upon migratory birds in conjunction with complying with NEPA; and minimizing potential take of migratory birds in cooperation with USFWS.

SCH Project implementation would meet EO 13186's intent by restoring migratory bird habitat at the Salton Sea.

6.1.1.15 National Historic Preservation Act (16 United States Code 470)

Federally funded undertakings that have the potential to impact historic properties are subject to National Historic Preservation Act section 106. Under section 106, Federal agencies are prohibited from approving any Federal "undertaking" (including the issuance of any license, permit, or approval), without (1) taking into account the effects of the undertaking on the historic properties; and (2) affording the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. In addition, under this Act, Federal agencies are responsible for the identification, management, and nomination to the National Registry of Historic Places of cultural resources that would be impacted by Federal actions.

The Corps will undertake section 106 consultation related to the SCH Project with the State Historic Preservation Officer. Consultation would include delineation of the Project's Area of Potential Effects and request concurrence with the findings of the cultural resources investigations for the Project.

6.1.1.16 Archaeological Resources Protection Act (16 United States Code 470)

The Archaeological Resources Policy Act of 1979 provides for the protection of archaeological resources on public and Indian lands. Protection of archaeological resources, under this Act's guidelines, includes consideration of excavation and removal of resources, enforcement of this Act, and confidentiality of information concerning the nature and location of archaeological resources. It also provides substantial criminal and civil penalties for those who violate this Act's terms.

The SCH Project has the potential to adversely affect cultural resources, but would be in compliance with this Act given the implementation of MM CR-1, identified in Section 3.5, Cultural Resources.

6.1.1.17 Pollution Prevention Act of 1990 (42 United States Code 13101)

The Pollution Prevention Act of 1990 was enacted to focus industry, government, and the public on source reduction (pollution prevention) rather than upon treatment and disposal. The United States national policy is that (1) pollution should be prevented or reduced at the source, whenever feasible; (2) pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; (3) pollution that cannot be prevented or recycled should be treated in an environmentally safe manner, whenever feasible; and (4) disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner.

The SCH Project would contribute only minor amounts of pollution, primarily during the construction phase and during maintenance activities. Moreover, only minimal amounts of solid waste requiring disposal would be generated during construction and operations and would be disposed of in an environmentally safe manner. The SCH Project would be consistent with this Act.

6.1.2 State of California Laws and Regulations

6.1.2.1 California Endangered Species Act (California Fish and Game Code Section 2050-2116)

The California Endangered Species Act prohibits the take of listed species without authorization from the DFG. DFG may authorize the taking of listed species if certain conditions are met. As described in Section 3.4, the SCH Project could impact listed species. Therefore, it is anticipated that a section 2081 incidental take permit would be issued by DFG for the SCH Project's construction and maintenance activities.

6.1.2.2 California Lake and Streambed Alteration Program (Fish and Game Code Section 1600 et seq.)

This Program requires any person, state, or local government agency, or public utility proposing a project that could divert, obstruct, or change the natural flow of any bed, channel, or bank of a river, stream, or lake to notify DFG before beginning the project. If DFG determines that the project could adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required. Such an agreement would be required for the SCH Project.

6.1.2.3 Porter-Cologne Water Quality Control Act (Division 7, California Water Code)

The Porter-Cologne Water Quality Control Act modified the California Water Code to establish the responsibilities and authorities of the SWRCB and nine RWQCBs. The SWRCB formulates and adopts state policy for water quality control. The RWQCBs develop water quality objectives and Basin Plans that identify beneficial uses of water, establish water quality objectives (limits or levels of water constituents based on Federal and state laws), and define implementation programs to meet water quality objectives.

The SCH Project lies within CRBRWQCB's boundaries. The Salton Sea's salinity already exceeds CRBRWQCB's Basin Plan objective (it currently is approximately 51 parts per thousand, whereas the objective is 35 parts per thousand). As shown in Table 3.11-7, Salton Sea Salinity – No Action and SCH Project, the Sea's salinity is projected to increase regardless of whether the Project is implemented. The Project would result in an incremental increase in salinity over time, but it would be less than significant when compared to both the existing condition and the No Action Alternative; therefore, the SCH Project would be in compliance with the Porter-Cologne Water Quality Control Act and would not conflict with this Basin Plan.

6.1.2.1 California State Lands Commission Public Trust Doctrine

The California State Lands Commission (SLC) manages State-owned lands that underlie California's navigable and tidal waterways. The State holds these lands, known as "sovereign lands," for the benefit of all the people of the state, subject to the Public Trust for water-related commerce, navigation, fisheries, recreation, open space, and other recognized Public Trust uses." The precise jurisdiction of the SLC within the SCH Project area will be determined by the SLC, and lands within its jurisdiction would be subject to a lease for use of sovereign lands. Uses of trust lands, whether granted under a lease, or administered by the State directly, are generally limited to those that are water dependent or related, and include commerce, fisheries, and navigation, environmental preservation, and recreation. Public trust lands may also be kept in their natural state for habitat, wildlife refuges, scientific study, or open space. Ancillary or incidental uses (uses that directly promote trust uses, are directly supportive and necessary for trust uses, or that accommodate the public's enjoyment of trust lands) are also permitted.

The SLC has determined that parcel 020-010-030, which falls within the boundaries of Alternatives 4 and 6 (Figure 1-2), is within its jurisdiction and would require a lease that would be subject to findings of consistency with the Public Trust Doctrine and the Public Trust Policy administered by the SLC. The proposed uses for the SCH Project fall within the definition of uses consistent with the Public Trust Doctrine and Policy.

6.1.2.2 Imperial County Air Pollution Control District (ICAPCD) Regulation VIII, Fugitive Dust Rules (800-806)

The purpose of Regulation VIII, Fugitive Dust Rules 800 through 806 is to reduce the amount of particulate matter (PM_{10}) entrained in the ambient air as a result of emissions generated from anthropogenic fugitive dust sources (e.g., construction and other earthmoving activities, outdoor handling

of bulk materials, track-out and carry-out activities, etc.) generated from within Imperial County by requiring actions to prevent, reduce, or mitigate PM_{10} emissions. Rules 800 through 806 apply to any active operation and/or human-made or human-caused condition or practice capable of generating PM_{10} emissions as specified in this regulation.

The Project would be required to comply with Regulation VIII. In general, this regulation would require notifying ICAPCD, identification of fugitive dust mitigation measures, submittal for ICAPCD approval of a Fugitive Dust Control Plan, and designation of an individual responsible for implementation of the Fugitive Dust Control Plan. These actions will ensure that the SCH Project is in compliance with this ICAPCD regulation.

6.2 CONSULTATION AND COORDINATION

A Public Information and Outreach Plan was developed to ensure a transparent process in which all Salton Sea Stakeholders and interested members of the public have the opportunity to be informed about the SCH Project and to provide input to the process. The targeted audience includes the following:

- General public;
- County supervisors;
- Water district boards;
- City officials within the region/watershed;
- All local Stakeholder groups and key local leaders;
- Agricultural and environmental interests;
- Residents in the Salton Sea community;
- Tribes;
- Economic interests;
- Geothermal development companies;
- Salton Sea Authority members;
- Imperial Group members;
- All local State Legislators and other Legislators on key committees; and
- Local congressional members.

Additionally, certain statutes and regulations require the Corps and Natural Resources Agency to initiate consultations with Federal and state agencies and Federally recognized Native American groups regarding the potential for the SCH Project to disturb sensitive resources. The consultations are generally required before any land disturbance can begin. Most of these consultations are related to biological, cultural, and Native American resources. Biological resource consultations generally pertain to the potential for activities to disturb sensitive species or habitats. Cultural resource consultations pertain to the potential for destruction of important cultural or archaeological sites. Native American consultations are concerned with identifying tribal concerns and issues related to a proposed Project, including the potential for disturbance of Native American ancestral sites or traditional practices or resources. To date, a number of different outreach activities have been carried out, including compiling and using mailing lists for distribution of Project information, issuing newsletters and press releases, developing a California Department of Water Resources website containing information about the SCH Project, publishing official notices, and conducting public meetings and hearings.

6.2.1 Public Involvement

The scoping process, intended to solicit input into the contents of this EIS/EIR is described in Chapter 1. In addition, meetings have been held with the Imperial County Farm Bureau and geothermal development companies to obtain their input regarding the scope of this document and potential conflicts with existing and future land uses. A meeting also was held to obtain input from non-governmental organizations; those invited to participate included the Audubon Society, California Waterfowl Association, California Outdoor Heritage Alliance, Defenders Of Wildlife, Desert Protective Council, Environment Now, Pacific Institute, Planning and Conservation League, Sierra Club, the Nature Conservancy, and the Wildlands Conservancy. Project Quarterly Stakeholder meetings have been held for interested members of the general public to keep them apprised of Project progress and solicit their input regarding the design of the SCH Project and potential impacts. Table 6-1 summarizes the dates and locations of public involvement meetings.

Table 6-1 Public Involvement Meeting Dates and Primary Topics Addressed

Meeting Date	Meeting Location	Primary Topics Addressed
Stakeholder Meetings & Workshops		
March 23, 2010	Palm Desert, CA	Update on the Salton Sea Restoration Program and Fund; information on the proposed Salton Sea Grant Program concepts; background information on the SCH Project; SCH Project overview; information on SCH Project NEPA/California Environmental Quality Act compliance, permitting, and design; and anticipated SCH Project schedule.
June 10, 2010	Palm Desert, CA	Stakeholder Meeting: Follow-up on March 23, 2010 Stakeholder Meeting; Period 1 Activity status; Salton Sea Restoration Fund update; information on the Salton Sea Funding Assistance Program; review and update on the SCH Project; and SCH Project Workshop updates. Workshop: Goals and objectives of SCH Project; SCH Project critical screening criteria; discussion of generalized alternative locations; SCH Project construction challenges; and discussion of next steps (design considerations).
October 19, 2010	Palm Desert, CA	Stakeholder Meeting: Follow-up on June 10, 2010 Stakeholder Meeting; current status of the Salton Sea; Salton Sea-related legislation update; information on the Salton Sea Financial Assistance Program; SCH Project EIS/EIR scoping (process and comments); SCH Project alternatives development process; information on conceptual alternatives for SCH Project; update on selenium treatment technologies and selenium management, in relation to the SCH Project; and a SCH Project schedule update. United States Geological Survey (USGS) Salton Sea Science Office Activities Update: information on the Salton Sea Seismic Imaging Project; information on the Light Detection and Ranging Project; information on the Desert Landscape Conservation Cooperative; general Salton Sea monitoring programs performed by the USGS; and a status update on the joint State-USGS Monitoring and Assessment Plan.
April 12, 2011	Palm Desert, CA	Follow-up on October 19, 2010 Stakeholder Meeting; Salton Sea Restoration Fund update; current status of the Salton Sea; current schedule of SCH Project; updates on SCH Project Stakeholder Meetings with the Imperial County Farm Bureau, Imperial Irrigation District, geothermal developers, NWR, vector control agencies, and elected officials; SCH Project special studies overview (fish tolerance study, hydrologic modeling, preliminary geotechnical studies, contaminant survey, selenium ecorisk, and adaptive management); SCH Project alternatives; and the

		Salton Sea Financial Assistance Program.
Scoping Meetings		
July 7, 2010	Palm Desert and Thermal, CA	Purpose and need of the SCH Project; role of the Lead Agencies; goals of the SCH Project; possible alternatives locations; key SCH project components; current schedule; and overview of the SCH Project scoping process.
July 8, 2010	Calipatria and Brawley, CA	Please refer to the topics listed for the July 7, 2010 scoping meetings.
Imperial County Farm Bureau		
October 28, 2010	El Centro, CA	Relationship of the SCH Project to the Quantification Settlement Agreement; information on the changing Salton Sea conditions since the Salton Sea Programmatic EIR was certified; selenium and the SCH Project; water supply and water quality discussions relating to the SCH Project; dissolved oxygen levels and the SCH Project; geothermal development companies' interests and the SCH Project; SCH Project's potential impacts to agriculture in the Imperial Valley; SCH Project funding; and information on the SCH Project description.
Geothermal Development Companies		
November 8, 2010	Imperial, CA	Discussions on how the SCH Project and geothermal development companies either work together or co-locate resources that will satisfy both of their project goals and objectives.
November 15, 2010	Imperial, CA	Please refer to the topics listed for the November 8, 2010 geothermal development companies meeting.
December 15, 2010	Imperial, CA	Ram Power geothermal development plans; compatibility with the SCH Project; potential synergies between permitting efforts.
Nongovernmental Organizations		
May 23, 2011	Sacramento, CA and via teleconference	Financial issues, communications with Stakeholders, Financial Assistance Plan, Too much money being spent and nothing has been built.

6.2.2 Federal, State, and Local Agency Consultation and Coordination

Federal, state, and local agencies have participated in the quarterly Stakeholder meetings discussed above. Individual meetings have been held with Imperial Irrigation District (IID) and with the USFWS to discuss other future plans, including geothermal development and additional habitat restoration, in the same areas being considered for the SCH ponds. Table 6-2 summarizes the dates and locations of Federal, state, and local agency consultation and coordination meetings.

Table 6-2 Agency Consultation and Coordination Meeting Dates and Primary Topics Addressed

Meeting Date	Meeting Location	Agency	Primary Topics Addressed
September 20, 2010	Calipatria, CA	USFWS	Preliminary discussion of USFWS' Red Hill Bay Project – status, description, goals and objectives, permitting status; and preliminary project-sharing opportunities.
October 21, 2010	Imperial, CA	IID	SCH Project's compatibility with IID's required air quality mitigation and the IID-USFWS restoration project at Red Hill Bay; SCH Project's potential conflict with geothermal projects near the Alamo River; maintaining pupfish drain connectivity with the Salton Sea; and IID supplying power to the SCH Project.
October 27, 2010	Imperial, CA	IID	SCH Project's compatibility with geothermal projects; agreement between the State and IID regarding drain connectivity to the Salton Sea; IID will lease lands to SCH Project; and water rights issues on the New and Alamo rivers.
February 11, 2011	Sacramento, CA	IID and USFWS	Description/status of SCH Project; description of USFWS Red Hill Bay Project; issues and relationships with IID Projects; and areas of project overlap/cooperation.
February 14, 2011	Teleconference	IID	Compatibility of the SCH Project with geothermal development on IID land.

6.2.3 Tribal Consultation and Coordination

As part of its Section 106 consultation process, the Corps requested information regarding cultural and Native American resources in the SCH Project area from the Torres Martinez Desert Cahuilla Indians, Quechan Indian Nation, Manzanita Band of the Kumeyaay Nation, La Posta Band of Mission Indians, Kwaaymii Laguna Band of Mission Indians, Kumeyaay Cultural Heritage Preservation, Fort Yuma Quechan Nation, Ewiiaapyaap Tribal Office, Cocopah Museum, Campo Kumeyaay Nation, Augustine Band of Cahuilla Mission Indians, and the Ah-Mut-Pipa Foundation. Appendix L contains copies of the consultation letters sent by the Corps and responses received from the tribes. To date, the only responses have been a general statement of support for the Project and request for clarification of the location of the SCH Project in relation to Obsidian Butte from the Quechan Tribe and a statement that the Cocopah Indian Tribe has no comments at this time.

6.2.4 Elected Officials Consultation and Coordination

A number of elected officials have participated in the quarterly Stakeholder meetings discussed above. Individual meetings have also been held with elected officials to discuss the SCH Project. Table 6-3 summarizes the dates and locations of elected officials' consultation and coordination meetings.

Table 6-3 Elected Officials' Consultation and Coordination Meeting Dates and Primary Topics Addressed

Meeting Date	Meeting Location	Agency	Primary Topics Addressed
July 21, 2010	Palm Desert, CA	John Benoit, Riverside County Supervisor	Status and goals of the SCH Project; feedback and concerns.
January 6, 2011	El Centro, CA	Imperial County District 2 Supervisor Jack Terrazas	Status and goals of the SCH Project; feedback and concerns.
January 25, 2011	El Centro, CA	Imperial County District 4 Supervisor Gary Wyatt	Status and goals of the SCH Project; feedback and concerns.
January 26, 2011	Sacramento, CA	Jose Carmona, Chief of Staff, and Josephina Ramirez, Capitol Director for Assemblyman V. Manuel Perez (80th Assembly District)	The recent history regarding restoration of the Salton Sea; the status and goals of the SCH Project; feedback and concerns.
February 16, 2011	Sacramento, CA	Senator Bill Emmerson	The recent history regarding restoration of the Salton Sea; the status and goals of the SCH Project; accept feedback and concerns.
February 16, 2011	Sacramento, CA	Jim Anderson, Chief of Staff, and John Ackler, Legislative Aide for Senator Juan Vargas	The recent history regarding restoration of the Salton Sea; the status and goals of the SCH Project; feedback and concerns.
April 19, 2011	Riverside, CA	Marion Ashley, Riverside County Supervisor	The recent history regarding restoration of the Salton Sea; the status and goals of the SCH Project; feedback and concerns.

SECTION 7

SUMMARY COMPARISON OF ALTERNATIVES

7.1 INTRODUCTION

This section compares the environmental impacts of the Species Conservation Habitat (SCH) Project alternatives and identifies the environmentally preferable/environmentally superior alternative, as well as the California Natural Resources Agency's preferred alternative. The United States Army Corps of Engineers has not yet identified a preferred alternative among the alternatives evaluated by the Draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

In Section 3, the impacts of the SCH Project alternatives on each resource evaluated in this Draft EIS/EIR were compared to both the existing environmental conditions, as well as those that would occur under the No Action Alternative. For many resources no substantive differences existed between the two scenarios, either because impacts would cease upon the completion of construction, in which case the future conditions would not be relevant, or because future changes at the Salton Sea would not be relevant (e.g., the amount of noise generated by pumps used to divert river water to the SCH ponds would not be affected by changes in the salinity or surface water elevation of the Salton Sea). For resources such as biological resources and recreation, the benefits of the Project alternatives would be greater when compared to the No Action Alternative because the increasing salinity and decreasing water surface elevation of the Salton Sea will result in the collapse of the Sea's ecosystem, and the SCH Project would help offset some of the impacts from this occurrence. The beneficial impacts of the Project on aesthetic resources also would be greater in comparison to the No Action Alternative. In no case, however, did the comparison of impacts between the existing conditions and the No Action Alternative result in a change in the significance of the impact.

7.2 COMPARATIVE IMPACTS OF THE PROJECT ALTERNATIVES

Table 7-1 compares impacts, by resource, for each of the six Project alternatives. In a number of cases, multiple categories of impacts would occur; that is, one resource could experience significant, less-than-significant, and beneficial impacts. Table 7-1 only shows the most adverse impact for purposes of comparison. As shown, impacts are generally comparable between alternatives. The primary differences are that those alternatives requiring a brackish water pipeline leading from the rivers (Alternatives 1 and 4) would result in less than significant impacts from the permanent conversion of Important Farmland and significant impacts from the potential conversion of land under Williamson Act contracts for use as a sedimentation basin. More subtle differences result from the acreage that would be restored under each alternative. In general, those alternatives with greater acreage would have greater benefits to resources such as biological resources, aesthetics, recreation, and socioeconomics, but also would result in greater impacts on air emissions, energy demand, transportation impacts, and demand for public services.

Table 7-1 Summary of Impacts, by Resource, of Each Project Alternative

Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6
Aesthetics	L	L	L	L	L	L
Agricultural Resources	S	O	O	S	O	O
Air Quality	U	U	U	U[a]	U[a]	U[a]
Biological Resources	S	S	S	S	S	S
Cultural Resources	S	S	S	S	S	S
Energy Consumption	L	L	L	L	L	L
Environmental Justice	U	U	U	U	U	U
Geology and Soils	L	L	L	L	L	L
Greenhouse Gas Emissions	L	L	L	L	L	L
Hazards and Hazardous Materials	L	L	L	L	L	L
Hydrology and Water Quality	L	L	L	L	L	L
Indian Trust Assets	O	O	O	O	O	O
Land Use	L	L	L	L	L	L
Noise	L	L	L	S	S	S
Paleontological Resources	S	S	S	S	S	S
Population and Housing	L	L	L	L	L	L
Public Services	L	L	L	L	L	L
Recreation	B	B	B	B	B	B
Socioeconomics	L	L	L	L	L	L
Transportation	L	L	L	L	L	L
Utilities and Service Systems	L	L	L	L	L	L

Notes:

a.* Alternatives 4, 5, 6 would result in a significant unavoidable impact from nitrogen oxides emissions during construction, as would Alternatives 1, 2, and 3; but unlike the latter alternatives, they would not result in a significant impact from fugitive dust emissions.

O = No Impact
L = Less-than-Significant Impact
S = Significant Impact, but Mitigable to Less than Significant
U = Significant Unavoidable Impact
B = Beneficial Impact

7.3 ENVIRONMENTALLY PREFERABLE/ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The Council on Environmental Quality's National Environmental Protection Act Guidelines, section 1505.2(b) requires that, in cases where an EIS has been prepared, the Record of Decision (ROD) must identify all alternatives that were considered, ". . . specifying the alternative or alternatives which were considered to be environmentally preferable." The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in National Environmental Protection Act section 101. Ordinarily, this designation means the alternative that causes the least damage to the biological and physical environment; the designation also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources. Additionally, the United States Environmental Protection Agency's section 404(b)(1) Guidelines require the Corps to issue a permit only for the "least environmentally practicable alternative," which is the most practicable alternative that would result in the least damage to aquatic resources and is not contrary to the public interest. Therefore, the "least environmentally damaging practicable alternative" will be the Corps' preferred alternative. California Environmental Quality Act Guidelines section 15126.6 also requires the identification of the environmentally superior alternative; if the No Action Alternative is considered environmentally superior, then an environmentally superior alternative must be chosen from one of the Project alternatives.

The No Action Alternative for the SCH Project is not considered environmentally superior. As discussed in Section 1, Introduction, declining inflows in future years from various factors will result in collapse of the Salton Sea ecosystem due to increasing salinity and other water quality issues, such as temperature, eutrophication, and related anoxia and algal productivity. The SCH Project alternatives would restore a portion of the habitat that will be lost under the No Action Alternative and are considered preferable.

Of the Project alternatives, those that would require gravity diversion of water from the New or Alamo rivers (Alternatives 1 and 4, respectively) are not considered environmentally superior because construction of the sedimentation basin would result in the permanent loss of Important Farmland, which is a less than significant impact and the potential conversion of land under Williamson Act contracts to nonagricultural use. These impacts would not occur under the alternatives requiring pumped diversion (Alternatives 2, 3, 5, and 6) because the sedimentation basins would be located within the footprint of the SCH ponds, which would not be constructed on farmland. Of Alternatives 2, 3, 5, and 6, those located at the Alamo River (Alternatives 5 and 6) are not considered environmentally superior for a variety of reasons. Alamo River water includes higher levels of selenium than that of the New River. Although impacts from selenium would be less than significant, selenium would have adverse effects on wildlife, and lower levels would be preferable within the SCH ponds. Similarly, the Alamo River area is more geologically active than the New River area (mud pots are present adjacent to and within the Project area east of the Alamo River in Morton Bay), which could lead to an increased risk of berm failure. Although this impact is not considered significant, it would not be desirable and would result in temporary, but adverse impacts on SCH pond operation. The Alamo River area also is in a Known Geothermal Resource Area and known geothermal resources diminish west of the New River. Although the SCH Project would not preclude geothermal development, the New River area is considered preferable because the potential for conflicts with geothermal development companies would be minimized. Thus, Alternatives 5 and 6 were eliminated from consideration as the environmentally superior alternative.

Alternatives 2 and 3 would be located at the New River and would restore 2,670 and 3,770 acres of habitat, respectively. Alternative 3 would cause somewhat greater impacts during construction (and indirect air emissions during operations), but it would have greater long-term benefits because more habitat would be restored. The long-term benefits would offset the short-term, incremental increase in construction impacts (and incremental increases in power demand), and thus, Alternative 3 is considered the environmentally preferable/environmentally superior alternative.

7.4 PREFERRED ALTERNATIVE

The Natural Resources Agency has identified Alternative 3 as the preferred alternative because it would provide greater long-term benefits by restoring the greatest amount of habitat, while minimizing environmental impacts to the extent feasible.

SECTION 8

Acronyms and Glossary of Terms

8.1 ACRONYMS

°C	degrees Celsius
°F	degrees Fahrenheit
AADT	annual average daily traffic
AB	Assembly Bill
af	acre-feet
afy	acre-feet per year
ACHP	Advisory Council on Historic Preservation
AHPA	Archeological and Historic Preservation Act
AIRFA	American Indian Religious Freedom Act
APE	Area of Potential Effects
AQMP	Air Quality Management Plan
ATLs	Advisory Tissue Levels
Basin	Salton Sea Air Basin
BLM	Bureau of Land Management (U.S. Department of the Interior)
BMP	Imperial County Bicycle Master Plan
BP	Before Present
CAA	Clean Air Act of 1970
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation

CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDCAP	California Desert Conservation Area Plan
CDDSRC	Colorado Desert District Stout Research Center
CEC	California Energy Commission
CESA	California Endangered Species Act
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIMIS	California Irrigation Management Information System
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent(s)
CH_4	methane
CNEL	Community Noise Equivalent Level
Corps	United States Army Corps of Engineers
CRBRWQCB	Colorado River Basin Regional Water Quality Control Board
CRHR	California Register of Historical Resources
CVWD	Coachella Valley Water District
CWA	Clean Water Act
dB	decibel(s)
dBA	A-weighted decibel(s)

DFG	California Department of Fish and Game
DO	dissolved oxygen
DOF	Department of Finance
DSOD	Division of Safety of Dams
DTSC	Department of Toxic Substances Control
dw	dry weight
DWR	California Department of Water Resources
EA	Environmental Assessment
EDD	California Economic Development Department
EO	Executive Order
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
ESA	Federal Endangered Species Act
FAA	Federal Aviation Administrative
FCG	Fish Contaminant Goals
Fe (III)	oxidizable iron
FMMP	Farmland Mapping and Monitoring Program
FP	fully protected
FR	Federal Register
GHG	greenhouse gas
GIS	Geographic Information System
gpm	gallons per minute
gpd	gallons per day
GWP	Global Warming Potential
HCP	Habitat Conservation Plan

HCPS	hantavirus cardiopulmonary syndrome
HI	hazard index
HSWA	Hazardous and Solid Waste Amendments
I-	Interstate
ICAPCD	Imperial County Air Pollution Control District
ICVCD	Imperial County Vector Control District
IID	Imperial Irrigation District
IPCC	Intergovernmental Panel on Climate Change
ITA	Indian Trust Assets
IVAG	Imperial Valley Association of Governments
IVS	Imperial Valley Solar
JPA	joint powers agreement
Kd	partitioning coefficient
KGRA	Known Geothermal Resource Area
KOPs	Key observation points
Ldn	day/night average sound level
Leq	equivalent sound level
LGMA	Leafy Green Products Handler Marketing Agreement
LLNL	Lawrence Livermore National Laboratory
LOS	level of service
Metropolitan	Metropolitan Water District of Southern California
µg/g	microgram(s) per gram
µg/L	microgram(s) per liter
$\mu g/m^3$	microgram(s) per cubic meter
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter

MICR	Maximum Individual Cancer Risk
MM	Mitigation measure
MND	Mitigated Negative Declaration
MOA	Memorandum of Agreement
MOA	Military Operations Area
MMT	million metric tonne(s)
msl	mean sea level
MW	megawatt(s)
MW-hr	megawatt-hour(s)
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAF	Naval Air Facility
NAHC	Native American Heritage Commission
NCCP	Natural Community Conservation Plan
NEPA	National Environmental Policy Act
New East	New River
New West	shoreline to the southwest
ng/g	nanogram(s) per gram
ng/L	nanogram(s) per liter
NHPA	National Historic Preservation Act
NO	nitric oxide
NPDES	National Pollutant Discharge Elimination System
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NOP	Notice of Preparation

NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWP	nationwide permit
NWR	(Sonny Bono Salton Sea) National Wildlife Refuge
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OHP	Office of Historic Preservation
OPR	Office of Planning and Research
PA	Programmatic Agreement
PEC	Probable Effects Concentration
PEIR	Programmatic Environmental Impact Report
PERP	Portable Equipment Registration Program
$PM_{2.5}$	particulate matter 2.5 microns or smaller in diameter
PM_{10}	particulate matter 10 microns or smaller in diameter
ppm	part(s) per million by volume
ppmv	part(s) per million by volume
ppt	part(s) per thousand
PRC	Public Resources Code
PVC	polyvinyl chloride
QSA	Quantification Settlement Agreement
RACT	Reasonably Available Control Technology
RDA	Recommended Dietary Allowance
Reclamation	Bureau of Reclamation
RfD	Reference Dose
ROG	reactive organic gas
RV	recreational vehicle

SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCH	Salton Sea Species Conservation Habitat Project
SCIC	South Coastal Information Center
SDCWA	San Diego County Water Authority
Se	selenium
Sea	Salton Sea
SCH	Species Conservation Habitat
SIP	State Implementation Plan
SHP	Reclamation/USGS saline habitat ponds
SHPO	State Historic Preservation Officer
SLC	State Lands Commission
SLV_{BH}	bioaccumulation screening levels
SMA	special management area
SNA	Significant Natural Area
SO_2	sulfur dioxide
SR	State Route
SSA	Salton Sea Authority
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
SSTB	Salton Sea Test Base
SVP	Society of Vertebrate Paleontology
TAC	toxic air contaminant
TBACT	Toxic Best Available Control Technology
TCP	Traditional Cultural Properties

TMDL	Total Maximum Daily Load
TTF	trophic transfer factorUSBEA United States Bureau of Economic Analysis
µg/g	microgram(s) per gram
µg/kg	microgram(s) per kilogram
U.S.	United States
USC	United States Code
USFWS	United States Fish and Wildlife Service
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	volatile organic compound
ww	wet weight

8.2 GLOSSARY OF TERMS

A-weighted decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear
Acre-foot	A quantity of water sufficient to cover one acre to a depth of one foot (43,560 cubic feet or 325,851 gallons)
Adaptive management	The process of refining or redefining management actions as a process unfolds and results are obtained. Adaptive management is an interactive and iterative approach to decision-making that incorporates feedback for evaluating actions and adding new information as it becomes available.
Air quality management	The IID Water Conservation and Transfer Project Mitigation Monitoring and Reporting Plan included the following four-step air quality mitigation and monitoring plan: restrict access to exposed playa; conduct a research and monitoring program; create or purchase offsetting emission reduction credits; and direct emission reductions at the Salton Sea by implementing feasible dust mitigation measures or supplying water to the Sea to maintain moisture on the playa exposed by QSA actions. Mitigation will only occur on the playa between -235 and -248 feet msl.
Alluvial soil	Soil developed on clay, silt, sand, and gravel sediments deposited by running water.

Ambient air quality standards	Standards established on state or Federal level that define the limits for airborne concentrations of designated criteria pollutants (nitrogen dioxide, sulfur dioxide, carbon monoxide, ozone, lead, and particulate matter) to protect public health with an adequate margin of safety (primary standards) and public welfare, including plant and animal life, visibility, and materials (secondary standards).
Amphibian	Ectothermic (or cold-blooded) animals that metamorphose from a juvenile water-breathing form, either to an adult air-breathing form, or to a paedomorph that retains some juvenile characteristics. Amphibians include such animals as frogs, salamanders, and caecilians.
Anaerobic	Active or occurring in the absence of oxygen.
Anoxic zone	An area without oxygen.
Anthropogenic	An effect or object resulting from human activity.
Aquatic	Living or growing in or on the water.
Aquifer or groundwater basin	A geologic formation that stores, transmits, and yields significant quantities of water to wells and springs.
Aquitard	Geologic formations or strata with relatively low permeability that retards the flow of water and yields negligible quantities to wells.
Archaeological site	Any location where humans have altered the terrain or left artifacts. The location of past cultural activity; a defined space with more or less continuous archaeological evidence.
Archaeology	A scientific approach to the study of human ecology, cultural history, and cultural process, emphasizing systematic interpretation of material remains.
Attainment area	An area that meets the National Ambient Air Quality Standards for a criteria pollutant under the Clean Air Act or that meets state air quality standards.
Avian botulism	A paralytic disease caused by ingestion of a toxin produced by the bacteria, *Clostridium botulinum*. This bacteria is widespread in soil and requires warm temperatures, a protein source and an anaerobic (no oxygen) environment in order to become active and produce toxin. Decomposing vegetation and invertebrates combined with warm temperatures can provide ideal conditions for the botulism bacteria to activate and produce toxin. Birds either ingest the toxin directly or may eat invertebrates (e.g., chironomids, fly larvae) containing the toxin. Invertebrates are not affected by the toxin and store it in their body
Avian cholera	A disease caused by different strains of the bacteria, *Pasteurella multocida*; however, in wild birds it is primarily caused by one strain, Type 1. The species of birds most commonly affected are ducks and geese, coots, gulls, and crows. The bacteria can be transmitted by bird-to-bird contact, contact with secretions or feces of infected birds, or ingestion of food or water containing the bacteria. Aerosol transmission may also occur. The bacteria may survive up to 4 months in soil and water.

Beneficial use	Actual or reasonable potential use that may be made of waters of the state, including but not limited to domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and propagation and enhancement of fish, wildlife, and other aquatic resources.
Benthic	Occurring or are located at the bottom of a water body (e.g., habitats and organisms associated with the bed of the Salton Sea).
Berm	In this document, refers to low height, compacted embankments designed to retain water for various impoundments. Exterior berms would define the outer boundary of an SCH unit (either cascading or independent), cascading berms would separate a cascading pond from an independent pond, and interior berms would subdivide the unit into individual ponds.
Bioaccumulation	The process by which chemicals are taken up by a plant or animal either directly from exposure to a contaminated medium (water, sediment, or soil) or by eating food containing the chemical.
Biotic	Relating to, produced by, or caused by living organisms.
Borrow	An area where material (usually soil, gravel or sand) has been dug for use at another location. In this document, the basic borrow areas would be adjacent channels, swale channels, and shallow excavations. Shallow borrow areas would be taken from the highest and driest ground, and would provide approximately 2-foot-deep water depths in areas that would otherwise have very shallow water less than 1 foot.
Brackish	Saline water with a salt concentration between freshwater and seawater.
Carbon dioxide equivalent	The concentration of carbon dioxide that would cause the same level of radiative forcing as a given type and concentration of greenhouse gas.
Carcinogen	A substance that induces cancer in living tissue.
Cascading pond unit	In this document, a pond unit would be attached to an independent pond unit on the outboard (Salton Sea) side and would receive water from an independent pond unit. The water surface in each pond would differ by about 2 feet. Cascading would be used to help aerate the water in the lower pond.
Clean Air Act (CAA)	Legislation that establishes air quality standards set by Federal, state, and county regulatory agencies for maximum allowable emission rates and pollutant concentrations for sources of air pollution on Federal and private property. Also regulated under this law is proper removal and safe disposal of asbestos from buildings other than schools.
Clean Water Act of 1972, 1987 (CWA)	The CWA is the major Federal legislation for improving the nation's water resources. It provides for development of municipal and industrial wastewater treatment standards and a permitting system to control wastewater discharges to surface waters. The act contains specific provisions for regulating ships' wastewater and for disposing of dredge spoils within navigable waters. Section 404 of the act regulates disposal into "Waters of the United States," including wetlands.

Climate change	A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.
Consumptive use	A use that makes water unavailable for other uses, usually by permanently removing it from local surface or groundwater storage as the result of evaporation and/or transpiration. Does not include evaporative losses from bodies of water.
Criteria pollutants	The Clean Air Act required the U.S. Environmental Protection Agency to set air quality standards for common and widespread pollutants after preparing criteria documents summarizing scientific knowledge on their health effects. Today there are standards for six criteria pollutants: sulfer dioxide, carbon monoxide, particulate matter less than 10 microns in diameter (PM_{10}), nitrogen dioxide, ozone, and lead.
Cultural resource	Prehistoric and historic districts, sites, buildings, objects, or any other physical evidence of human activity considered important to a culture, subculture, or a community for scientific, traditional, religious, or any other reason. Native American resources are sites, areas, and materials important to Native Americans for religious or heritage reasons. Resources may include prehistoric sites and artifacts, contemporary sacred areas, traditional use areas (e.g., native plant habitat), and sources for materials used in the production of sacred objects and traditional implements.
Decibel (dB)	A unit for measuring the relative loudness of sounds.
Detritus	Non-living particulate organic material (as opposed to dissolved organic material). It typically includes the bodies or fragments of dead organisms as well as fecal material.
Dissolved oxygen	Amount of oxygen held within water. The amount of oxygen that can be dissolved in water varies with the temperature of the water and the pressure of the atmosphere.
Diversity	A measure of the number (abundance) and types of organisms. See species richness.
Drainwater	In this document, drainwater is the major component of flow into the Salton Sea. Irrigation drainwater from agricultural activities in the Imperial Valley is collected in surface drains that discharge to the New or Alamo Rivers. Additionally, over 25 drains discharge directly into the Salton Sea.

Early Start Habitat	In this document, The SCH Project is consistent with the Early Start Habitat identified in the *Salton Sea Ecosystem Restoration Program Programmatic Environmental Impact Report* (PEIR), which was a temporary feature consisting of 2,000 acres of pond habitat constructed between elevations -228 to -232 feet mean sea level along the southern shoreline where the flat slope of the Seabed would provide a large area for the shallow water cells. Agricultural drains in this area could provide a stable source of inflows and saline water from the Sea would be mixed with fresher water from the drains to provide salinity between 20 to 60 parts per thousand. The 2,000 acres of habitat would be divided into cells with dikes constructed from excavated seabed materials. Average water depths within each cell would be less than 4 feet. The PEIR assumed that the Early Start Habitat could be implemented before 2011, following approval of the Preferred Alternative by the California Legislature, if easements or deeds could be acquired.
Easement	The right to use real property of another without possessing it.
Ecosystem	A biological environment consisting of all the organisms living in a particular area, as well as all the nonliving, physical components of the environment with which the organisms interact, such as air, soil, water and sunlight.
Emergency Outflow Structure	In this document, each SCH pond would be equipped with an emergency outflow structure that would allow the release of water during an emergency. The structure would be a weir that water would flow over and through the outlet in an emergency. The structure would not require human intervention to operate.
Emergent plant	A plant which grows in water but which pierces the surface so that it is partially in air. Collectively, these plants are called "emergent vegetation."
Epilimnion	The layer of water overlying the thermocline in a lake.
Equivalent noise level (Leq)	The equivalent steady state sound level that in a stated period of time would contain the same acoustical energy.
Erosion	The gradual wearing away of land by water, wind, and general weather conditions.
Eutrophic	Classification of lakes with high nutrient levels and high primary productivity. A water body with abundant organic matter and deficient levels of dissolved oxygen.
Evaporation	The process of liquid water becoming water vapor, including vaporization from water and land surfaces, but not from plant surfaces.
Evapotranspiration (ET)	The sum of water transpired and evaporated from plants and surrounding soil surfaces, expressed in feet per year.
Exotic species	A non-native plant or animal deliberately or accidentally introduced into a new habitat.
Exposed playa	In this document, refers to the area currently inundated by the Salton Sea that would be exposed as the Salton Sea recedes over time.
Extirpation	Local extinction or loss of all individuals within a local area or region.

Fault	An approximately planar break in a rock body caused by tectonic forces defined by movement of blocks of the earth's crust on either side.
Fault zone	A region bounded by major faults that internally may consist of additional minor faults.
Fauna	All of the animal life of any particular region or time.
Fetch	A measure of the water surface area where the wind continues at a constant direction and speed.
Fishery	A collection of fishes that are of sport or commercial value.
Flow	Volume of water passing a given point per unit of time expressed in cubic feet per second (cfs).
Food web	Food and feeding interrelationship between plants and animals.
Forage fish	A fish that is eaten by other animals.
Gage	Specific location on a stream where systematic observations of hydrologic data are obtained through mechanical or electrical means.
Geothermal	Relating to or using the heat of the earth's interior. At the Salton Sea, it relates to primarily to generation of energy using geothermal resources.
Gravity Diversion	In this document, the river gravity diversion would be located upstream (between 2 and 4 miles) of the Project area at a location that provides sufficient head to facilitate flow by gravity and enables necessary easements to be negotiated with landowners. The river from the diversion downstream to the Salton Sea would experience up to 150 cfs less flow because of the diversion. The diversion amount would vary depending on the month of the year and the SCH operations.
Greenhouse gas (GHG)	A gas in an atmosphere that absorbs and emits radiation within the thermal infrared range. The primary greenhouse gases discussed in this document are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride.
Groundwater	Waters in groundwater basins (aquifers), underground streams, and underground flow of a surface stream.
Habitat	The physical spaces within which species live, and the abiotic and biotic resources in those spaces. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.
Hydraulic conductivity	A property of vascular plants, soil or rock that describes the ease with which water can move through pore spaces or fractures. It depends on the intrinsic permeability of the material and on the degree of saturation.
Hypersaline	A type of body of water that contains significant concentrations of sodium chloride or other mineral salts, with saline levels surpassing that of ocean water.
Hypolimnion	The layer of water between the thermocline and the bottom of a lake, generally characterized by cooler temperature, low dissolved oxygen, and poor circulation.

Independent pond unit	In this document, a pond unit having one inflow point for brackish and saline water that can be subdivided into multiple smaller ponds. Water would be conveyed between the smaller ponds through a gated pipe, and the ponds would have similar water surface elevations.
Interception ditch	In this document, the interception ditch would accommodate the anticipated flows in the Imperial Irrigation District drains that the interception ditch intersects. The interception ditch capacity would be based on monitored drainflow on data collected by IID for the drains. The invert of the interception ditch would be set to avoid creating a backwater condition in the drains and allow continuity between the drains for pupfish.
Invertebrates	Animals without backbones.
Lacustrine	Lake-type environments with slower moving waters.
Lacustrine basin	A low area formed at the bottom of a lake from material deposited in lake water and exposed when the water level was lowered.
Lead agency	The agency initiating and overseeing the preparation of an EIS and/or EIR.
Liquefaction	A condition in which saturated or silty sands or sandy silts have no shear strength and behave as a liquid. Liquefaction occurs often with loose soils are subjected to ground shaking during an earthquake.
Macroinvertebrate	Animals without backbones that are large enough to be seen with the naked eye.
Mammal	Members of a class of air-breathing vertebrate animals characterized by the possession of hair, three middle ear bones, and mammary glands functional in mothers with young. Most mammals also possess sweat glands and specialized teeth, and the largest group of mammals, the placentals, has a placenta which feeds the offspring during gestation.
Mean	The average value of items in a sample.
Mean sea level (msl)	The average (mean) height of the ocean, with reference to a suitable reference surface. National Geodetic Vertical Datum (NGVD) of 1929.
Median	Number dividing the higher half of a sample, a population, or a probability distribution from the lower half. At most, half the population has values less than the median and at most half has values greater than the median.
Megawatt	One million watts of electrical power (capacity).
Megawatt hour	One million watt-hours of electrical energy.
Microclimate	A local atmospheric zone where the climate differs from the surrounding area.
Microhabitat	The small-scale physical requirements of a particular organism or population.
Mouthbrooder	Refers to a species in which the females carry the eggs and young fry in their mouths.
Noise	Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
Ocean salinity	35,000 mg/L with a range from 30,000 to 40,000 mg/L

Omnivorous	Meat and plant eating.
Pacific Flyway	The major north-south route of travel for migratory birds in the western Americas, extending from Alaska to Patagonia. Every year, migratory birds travel some or all of this distance both in spring and in fall, following food sources, heading to breeding grounds, or traveling to over-wintering sites.
Pathogen	A specific causative agent (such as a bacterium or virus) of disease.
Pelagic	Refers to fish living in the water column of the Salton Sea, but not on the bottom of the Sea.
Perennial	A plant that lives for more than two years. Perennials, especially small flowering plants, grow and bloom over the spring and summer and then die back every autumn and winter, then return in the spring from their root-stock rather than seeding themselves as an annual plant does.
Period I	The authorized activities and expenditures identified in the Natural Resources Agency report entitled *Salton Sea Ecosystem Restoration Program Preferred Alternative Report and Funding Plan*, and dated May 2007, for completion in the first 5 years of implementation ("Period I"). Activities specified for completion in Period I include, but are not limited to, a demonstration project, early start habitat, and additional biological, inflow, sediment quality, water quality, and air quality investigations.
Permeability	A measure of the ability of a material (such as rocks) to transmit fluids.
Phenology	The study of regularly recurring biological phenomena such as animal migrations or plant budding, especially as influenced by climatic conditions.
Photochemical reaction	A chemical reaction initiated by the absorption of energy in the form of light.
Phytoplankton	Very small free-floating aquatic plants such as one-celled algae, found in plankton.
Piscivorous	Habitually feeding on fish; fish-eating.
Plankton	Tiny animals and plants floating in the ocean or in lakes usually near the surface and eaten by fish and other aquatic animals.
Playa	A desert basin with no outlet which periodically fills with water to form a temporary lake.
Polymictic lake	Holomictic lakes (i.e., at some time during the year, the water will have a uniform temperature and density from top to bottom, allowing the lake waters to completely mix) that are too shallow to develop thermal stratification; thus, their waters can mix from top to bottom throughout the ice-free period.
Precipitate	To separate from solution or suspension.
Primary pollutant	An air pollutant emitted directly from a source.
Pumped River Diversion	In this document, the pumped river diversion would be located adjacent to the SCH ponds, upstream of the existing river/Sea confluence. The diversion would reduce the flow in the remaining river reach by up to 150 cfs depending on the month of the year and the SCH operations.

Pupfish connectivity	In this document, refers to allowing connection of the drains and/or creeks to allow for the continued transfer of genetic material among desert pupfish populations.
Reach	A specified segment of a stream, channel, or other water conveyance.
Refugia	Isolated habitats that retain environmental conditions that were once widespread.
Reptile	Any of the cold-blooded vertebrates constituting the class *Reptilia*, characterized by lungs, an outer covering of horny scales or plates, and young produced in amniotic eggs. The class today includes the tortoises, turtles, snakes, lizards, and crocodiles.
Residence time	Residence time is the amount of time water entering the SCH ponds from the New or Alamo rivers and Salton Sea would be retained in the ponds before being released to the Sea.
Restoration (habitat)	The process of restoring the functional aspects of a given ecosystem to a semblance of its pre-disturbed state.
Rift valley	A regionally extensive elongate trough bounded by two or more faults.
Riparian	Pertaining to the bank or shore of a water body.
Riprap	Rock or other material used to armor shorelines, streambeds, bridge abutments, pilings and other shoreline structures against scour, water or ice erosion
River diversion structures	In this document, the river diversion structures are the structures needed to divert water by gravity or pumping. These structures would be constructed by notching the banks of the river to set the structures into the bank rather than allowing them to project into the river. The completed diversion area will be lined with riprap or other suitable material to stabilize the bank and prevent erosion near the diversion.
Rookery	A colony of breeding animals, typically birds.
Runoff	Water that leaves an area or field as surface flow.
Salinity	A term used to refer to the dissolved minerals in water, also referred to as total dissolved solids.
Saline Habitat Complex	In this document, refers to shallow, saline water bodies managed as permanent habitat for fish and wildlife. Saline Habitat Complex are approximately 1,000 acre cells with water depths of less than 6 feet, and salinity ranging from 20 to 200 parts per thousand. The cells would be constructed with berms formed by excavating Seabed soils. The Seabed soils also would be used to form islands and peninsulas within the cells. Deep holes would be excavated in some areas of the cells to provide shelter for fish. The salinity in each cell could be different to allow for different fish and/or invertebrates in each cell. Salinity in some cells would be higher than 60,000 milligrams per liter and would only support invertebrates. All of the cells would provide habitat for a variety of birds. The Preferred Alternative in the PEIR identified 62,000 acres of Saline Habitat Complex.

SCH Outflow Structure	A SCH outflow structure would be installed at each SCH pond to ensure that each SCH pond has an independent outlet to the Salton Sea. Water would be released to the Sea through the pond outlet based on the residence time and the time to drain a pond, if needed.
Seabed	In this document, refers to the currently inundated area within the existing Salton Sea shoreline.
Secondary pollutant	A pollutant that is not directly emitted as such, but forms when other pollutants react in the atmosphere.
Sediment	Unconsolidated solid material that comes from weathering of rock and is carried by, suspended in, or deposited by water or wind.
Sediment/distribution basin	A device used to treat turbidity in wastewater. Wastewater enters the basin and very fine particles in the water are separated by means of gravity. The water must be in the basin long enough for the desired particle size to be removed. Smaller particles require longer periods for removal and thus larger basins.
Seiche	A standing wave on a lake or other closed water body caused by an earthquake or intense storm activity.
Selenium	A non-metallic element that chemically resembles sulfur.
Saline habitat ponds	Developed by the U.S. Geological Survey and U.S. Bureau of Reclamation at the southern end of the Salton Sea in 2006. The 100-acre project was decommissioned in 2010, but was divided into four 25-acre ponds less than 2 feet deep. Water pumped from the Salton Sea was mixed with water from the Alamo River in an attempt to maintain salinities in the series of ponds between 20 and 60 parts per thousand. Extensive monitoring was conducted to determine pond colonization by phytoplankton and invertebrates, bird use, and water quality. The ponds attracted a number of bird species that fed on the invertebrates and fish produced in the ponds.
Shorebirds	Bird species (e.g., sandpipers) associated with wetland or coastal environments and typically found at the margin and in shallow water areas.
Siltation	The pollution of water by fine particulate terrestrial clastic material, with a particle size dominated by silt or clay. It refers both to the increased concentration of suspended sediments, and to the increased accumulation (temporary or permanent) of fine sediments on bottoms where they are undesirable. Siltation is most often caused by soil erosion or sediment spill.
Snag	A standing, partly or completely dead tree, often missing a top or most of the smaller branches.
Soluble	Capable of being dissolved in a fluid.
Stratification	A situation or condition where something is arranged in several layers or strata. Stratification can result from a difference in temperature, salinity, or density.
Surface water	Water on earth's surface, as distinguished from water in the ground (groundwater).
Suspended solids	Small solid particles which remain in suspension in water as a colloid or due to the motion of the water.

Swale	In this document, a channel through the ponds that would be constructed with scrapers and excavators, and achieve 2- to 4-foot or potentially deeper water depths. It would ultimately serve as a habitat feature that connects shallow and deep areas of a pond.
Tailwater	Surface water runoff occurring at the end of an irrigated field when water that had been applied exceeds soil infiltration rates.
Threatened animal species	Any animal species likely to become endangered within the foreseeable future throughout all or a significant part of its range.
Torres Martinez ponds	A series of shallow freshwater habitat ponds at the Salton Sea's northern end constructed by the Torres Martinez Desert Cahuilla Indian Tribe. The ponds use flow from the Whitewater River to treat river water to remove contaminants, such as fertilizers, pesticides, and bacteria. The 85 acres of freshwater ponds have been successful in creating habitat used by a wide variety of wildlife, including over 130 bird species, due in large part to the presence of robust fish populations that have developed in the ponds.
Total dissolved solids (TDS)	The total dry weight of solids dissolved in a liquid per unit volume (e.g., milligrams per liter).
Transmissivity	The rate which groundwater flows horizontally through an aquifer.
Tributary	River or stream flowing into a larger river or stream.
Trophic function	Trophic function represents the power of the predator to consume the preys under a given number of the predators.
Turbidity	A measure of the collective optical properties of a water sample that cause light to be scattered and absorbed rather than transmitted in straight lines. Primary contributors to turbidity include clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, plankton, and microscopic organisms.
Turnover event	When thermal stratification in a lake breaks down and layers become mixed; can result from wind action and moderation of temperatures.
Vector	An organism (such as an insect) that transmits a pathogen.
Waterfowl	Any of various birds that swim on water; generally refers to ducks, geese, and swans.
Watershed	An area that, because of topographic slope contributes water to a specified surface water drainage system, such as a stream or a river.
Weir	A small overflow dam used to alter the flow characteristics of a river or stream. In most cases weirs take the form of a barrier across the river that causes water to pool behind the structure (not unlike a dam), but allow water to flow over the top
Wetlands	Periodically, seasonally, or continuously submerged landscapes populated by species and/or life forms differing from adjacent communities.
Zooplankton	Plankton composed of microscopic animals such as protozoans and larval invertebrates.

SECTION 9

List of Preparers

9.1 AGENCY PERSONNEL

United States Army Corps of Engineers

Joint Project Manager	Lanika Cervantes
Senior Project Manager	James Mace
Management Support	Therese O'Rourke Bradford

California Department of Fish and Game

Joint Project Manager	David Elms
Regional Manager, Inland Deserts Region	Kim Nicol
Aquatic Species Specialist	Jack Crayon
Senior Environmental Scientist	Michael Flores
Permitting Specialist	Sharon Keeney
Avian Species Specialist	Karen Riesz
Associate Governmental Program Analyst	Angela Salcedo
Permitting Specialist	Jim Sheridan
Research Program Specialist/GIS	Kristina White

California Department of Water Resources

Joint Project Manager	Kent Nelson
Contract Administrator	Cliff Feldheim
Management Support	Ted Frink
Environmental Program Manager	Charles Keene
Supervising Engineer, Water Resources	Thang (Vic) Nguyen

9.2 CARDNO ENTRIX

Project Management Team

Program Manager	Rob Thomson
Deputy Program Manager, Engineering Lead	Paul Wisheropp, P.E.
EIS/EIR Lead	Lorraine Woodman, Ph.D.
Special Studies Lead	Ramona Swenson, Ph.D.
Project Coordinator	Sarah Bumby
Senior Review	Mark Horne
Internal Website Administrator	Nancy Dorfman

Technical Team

Agricultural Resources	Darcy Kremin, AICP
Air Quality	Bradford Boyes, REA, QEP Chelsea Ayala
Biological Resources	Rosemary Thompson, Ph.D. Ramona Swenson, Ph.D. Tamara Klug Emily Floyd, Ph.D. May Lau Katie Simpson James Coleman, Ph.D.
Cultural Resources	John Nadolski Joshua Peabody
Energy Consumption	Paul Wisheropp, P.E. May Lau
Environmental Justice	Megan Schwartz
Greenhouse Gas Emissions and Climate Change	Bradford Boyes, REA, QEP Lorraine Woodman, Ph.D.
Hazards and Hazardous Materials	Terri Wallace Ramona Swenson, Ph.D. Emily Floyd, Ph.D. Katie Simpson James Coleman, Ph.D.

Hydrology and Water Quality	Paul Wisheropp, P.E. Ramona Swenson, Ph.D. Sarah Bumby Emily Floyd, Ph.D. James Coleman, Ph.D.
Indian Trust Assets	Megan Schwartz
Noise	May Lau Lorraine Woodman, Ph.D.
Recreation	Darcy Kremin, AICP
Socioeconomics	Megan Schwartz
Cumulative Impacts	Sarah Bumby Mark Horne
Other Sections Required by NEPA and/or CEQA	Mark Horne
Summary Comparison of Alternatives	Lorraine Woodman, Ph.D.
Compliance, Consultation, and Coordination	Sarah Bumby
GIS	Douglas Brice Anna Clare Eric Lee
Editing and Production	Rein Dillon Nancy Dorfman Violet Coto Hatipoglu Sandy LaRosa

9.3 DUDEK

Principal	Joe Monaco, AICP
Deputy Project Manager, EIS/EIR	Sarah Lozano, AICP
Aesthetics	Megan Stone
Biological Resources	Anita Hayworth, Ph.D. Callie Ford Patricia Schuyler
Geology, Soils, and Minerals	Jennifer Longabaugh
Land Use	Megan Stone

Population and Housing	Megan Stone
Public Services	Jennifer Longabaugh
Transportation and Traffic	Megan Stone
Utilities and Service Systems	Jennifer Longabaugh
Compliance, Consultation, and Coordination	Sherri Miller

9.4 DUCKS UNLIMITED

Lead Engineer and Designer	Vince Thompson, P.E.
Staff Engineer – Design Support	Jesse Ross
Staff Engineer – Topographic Surveys	Jeff Maiss
Technician – GIS/Concept Exhibits	John Sieber

9.5 CHAMBERS GROUP

Paleontological Resources	Mark Roeder

9.6 UNIVERSITY OF CALIFORNIA AT RIVERSIDE

Hazards and Hazardous Materials, Mosquito Control Plan	William Walton, Ph.D.

9.7 DAVIS GROUP

Public Outreach - Principal	Rick Davis
Public Outreach - Associate	Tim Bulone