Attachment 3: Work Plan

PSP Requirements:

Introduction

The City of Chino Arterial Flood and Stormwater Management Project is designed to manage stormwater runoff and reduce flood damages to Pine Avenue, a major east/west arterial, the utilities below the roadway, and surrounding properties within the City of Chino. The Project has been identified by the City of Chino for implementation due to the roadway's propensity for extreme flooding and damage during storm events as moderate as a 2-year event. Flooding of the roadway and surrounding property causes considerable damage to the roadway, compromises public safety and emergency preparedness and response through utility line damage and emergency service vehicle delays, and results in measurable erosion to surrounding private and utility easement properties.

The Project yields multiple benefits including:

- Reduced risk of flooding and flood damages through improved stormwater management
- Long-term sustainable flood and stormwater management system
- Improved emergency preparedness and response and public safety
- Improved water quality and reduced erosion and sediment transport to El Prado Lake, a 303(d) listed impaired body, and ultimately to the Prado Basin

Project Description

The existing drainage course in the subject area consists of a shallow and wide earthen channel and floodplain that crosses Pine Avenue through six 30" CMP culverts. The flow line of the existing channel is approximately 3' below the pavement on Pine Avenue. The combination of undirected waters to the north and south of Pine Avenue, undersized culverts, and low elevation of the roadway exposes the roadway and surrounding properties to damaging flood waters in high frequency low volume storm events, such as a 2-year storm event, which construction of this Project will alleviate.

The Project consists of construction of a triple 12'x4' precast reinforced concrete box (RCB) culvert that will extend approximately 300' from inlet to outlet. A 20'x10' trapezoidal earthen channel will be constructed upstream for 500' through the Southern California Edison (SCE) 500/220kv electrical transmission line easement to connect to an existing channel, and a 24' x 8' trapezoidal earthen channel will be constructed for 800' downstream to outlet the flood waters beyond the existing dairy "ponds" through the southerly adjacent landowner's property. The existing vertical alignment of Pine Avenue will be raised to provide cover over the culvert, which will bring the roadway profile above the 100-year flood plain. The system is designed to handle the region's ultimate build-out condition in a 100-year storm event.

The combined design aspects of this Project will increase the expediency at which stormwater is routed away from the roadway and immediate property, reducing the frequency of "backwater" events and the number of days that this major arterial is closed due to flooding to only the most severe of storm events (in exceedance of a 100-year event). Flooding of the roadway causes closures resulting in emergency response vehicle delays and damage to the road itself. Road failures have a high potential to result in damage to the underlying utilities, presenting a significant public safety concern. There are four major

utility lines running beneath the roadway that are subject to damage in the event of a street failure: The Inland Empire Brine Line (formerly known as the Santa Ana Regional Interceptor or "SARI" line); the Inland Empire Utility Agency's Treatment Plant 1 Outfall Line; the water line servicing the California Institution for Women in Chino; and a Natural Gas Line. Further discussion as to the potential effects of these failures follows in the Goals and Objectives.

Reduction of flooding and backwater events will also decrease flooding and erosion to the surrounding privately owned and utility easement properties. Flood events to the north of Pine Avenue affect SCE's access to their 500/220kv electrical transmission line, which services approximately 2.2 million Southern California residents. Flood events to the southerly property cause breaching of dairy "ponds" and increased erosion, which then carries sediment and pollutants downstream to the Prado Basin, the principle source of recharge for the Orange County groundwater basin and a primary source of drinking water for Orange County.

The Project is consistent with the Santa Ana Watershed's IRWM Plan, the Santa Ana Watershed Project Authority "One Water One Watershed", and Statewide priorities to (1) improve the region's flood protection by addressing stormwater flood risk at major master planned regional arterials, (2) provide sustainable flood water management systems through the construction of improved stormwater conveyance systems, (3) improve emergency preparedness and response, and (4) improve Regional water quality.

Project Goals and Objectives

The City of Chino Arterial Flood and Stormwater Management Project is located in the Santa Ana Watershed and is consistent with the region's IRWM Plan, the Santa Ana Watershed Project Authority "One Water One Watershed" ("OWOW").

This Project will achieve the following key goals and objectives, which are described in further depth below:

Goals

1. Improve regional flood protection
2. Provide sustainable flood water management systems
3. Improve emergency preparedness and response and public safety through the management of stormwater
4. Improve regional water quality and reduce erosion and sediment transport

Objectives

- Reduced risk of flooding at a major master planned arterial
- Increased expediency at which flood waters drain from the properties immediately surrounding the roadway, providing improved consistent access to the SCE transmission line to the north, which services 2.2 million Southern California residents, and reducing erosion to the private property to the south
- Reduced risk of damage to underground utilities

- Provide a long-term sustainable flood water management system through the construction of improved stormwater conveyance systems designed to withstand up to and including a 100-year storm event in the area's ultimate build out condition
- Improved emergency preparedness and response through the management of flood and stormwater, reducing the number of days this major arterial is closed due to damaging floodwaters
- Improved water quality in the Prado Basin, a valuable habitat area and the primary source of groundwater for downstream water users such as Orange County, through improved stormwater management designed to reduce pollutants, erosion and sediment transport

A more in depth discussion of each of the Project goals and objectives follows:

1. Improve Regional Flood Protection

- Current Conditions:

In its current state, Pine Avenue, a major east/west arterial that connects Interstate 15 and State Route 71, floods to an unusable and damage inducing state in minor storm events, such as a 2-year storm event. Flooding causes measurable damage to the roadway; erosion and flooding of surrounding properties, which include both privately owned property and Southern California Edison (SCE) 500/220kv power transmission line easement property; threatens the viability of public infrastructure; and adversely affects regional water quality. The combination of undersized culverts, the lack of sufficient channels to properly direct flows to the north and south of the Project, and the low elevation of the roadway exposes Pine Avenue and the surrounding properties to the damaging flood waters and erosive conditions that construction of this Project will alleviate. Exhibit A provides photos of the 2-year event that impacted the roadway in December 2010, illustrating the damaging and dangerous flood conditions this roadway has historically experienced.

The properties to the north and south of Pine Avenue, within the Project area, experience heavy flooding and erosion due to "backwater" events caused by the undersized culverts and insufficient channeling to direct stormwaters. SCE has an easement to the north of Pine through which 500/220kv power transmission lines run. This line services approximately 2.2 million Southern California residents. Flooding causes potential erosion around the towers and, more importantly, hinders maintenance access which could result in extended power loss to millions of Southern California residents. The privately owned property to the south is subjected to erosive conditions due to the inadequate stormwater conveyance system currently in place. These erosive conditions cause sediment transport, affecting the region's water quality, and causes the water quality dairy ponds to breach. Breaching of these ponds causes downstream transport of pollutants to El Prado Lake, a 303(d) listed impaired water body, and ultimately to the Prado basin, the primary source of groundwater recharge for Orange County.

During these moderate storm events with high frequency recurrence intervals (2-year storm events or larger) there is a high potential and historical occurrence of the undermining of Pine Avenue. There are four major utility lines running beneath the roadway that are subject to damage in the event of a street failure: The Inland Empire Brine Line (formerly known as the Santa Ana Regional Interceptor or "SARI" line), the Inland Empire Utility Agency's Treatment Plant 1 Outfall Line; the water line servicing the California Institution for Women in Chino; and a Natural Gas Line.

The Inland Empire Brine Line ("IEBL") is intended to carry brine and domestic and industrial waste. Currently, it handles domestic sewage from California Institution for Women and residents within the City of Chino, and also has connections for emergency discharge for the surrounding dairies. In the event of line damage or failure, the resulting sewage leak would pose a regional environmental hazard to wildlife, habitat, the immediate public, and downstream water users.

The Inland Empire Utility Agency's Treatment Plant 1 Outfall Line is owned and maintained by the Inland Empire Utility Agency ("IEUA"). The line conveys recycled water to downstream water users and outflows into El Prado Lake. Prior to discharging into the lake, the water is stripped of its high chlorine content at IEUA's Dechlor facility. A breach of this line would allow chlorinated water to flow directly into El Prado Lake, killing the fish and plant life within the lake.

The domestic water line running under Pine Avenue to the California Institution for Women, a female-only state prison located within the City of Chino, is the only source of water for the prison. Damage to this underlying water line would interrupt all water supplies to the prison. Water service disruption would have a significant impact to the Institution and would cause a relocation of prisoners to another facility.

A road failure has the potential to cause a rupture in the natural gas line running under the roadway. A rupture to this line has a significant impact both locally and regionally. A rupture locally, coupled with a detonation of the high pressure gas main, will likely have an impact area of a quarter mile from the rupture impacting over 250 local residences, the SCE transmission lines, and all circulation in the immediate area. Regionally, the impact would disrupt the service in several counties in Southern California including parts of San Bernardino, Riverside, Orange, and San Diego Counties. The gas transmission line is the southern California natural gas source for a significant number of residential, commercial, and industrial uses within the four county area.

Flood events at this location have additional regional effects through deterioration in water quality due to erosion, sediment transport, and increased pollutant load of suspended solids and sediments being conveyed to the Prado Basin. The Prado Basin contains some of the best and largest riparian habitat in Southern California. The Prado Basin also serves as the principle source of groundwater recharge for downstream water users, primarily those within the Orange County Water District service area.

- Project Goals and Objectives Achieved:

The City conducted studies through the Chino Preserve Specific Plan in 2003 and prior to determine the size of the ultimate planned facilities within the subject area. To maximize the resources available for the region, the City will construct a flood and stormwater management system for the ultimate needs, which provides for a minimum 50-year life of the Project.

Construction of this Project will provide flood protection for Pine Avenue, the underlying utilities, the SCE electrical transmission towers to the north, and the existing water quality dairy basins to the south. The combined design aspects of this Project will increase the expediency at which stormwater is routed away from the roadway and immediate property, reducing the frequency of "backwater" events and the number of days that this major arterial is closed due to flooding and potential road failures. Reduction of these flood induced erosive conditions will also serve to improve regional water quality. The improved system under this Project is designed to withstand a 100-year storm event in the region's ultimate build-out condition.

2. Provide Sustainable Flood Water Management Systems

- Current Conditions:

The combination of undersized culverts, the lack of channel to properly direct flows to the north and south of the Project, and the low elevation of the roadway exposes Pine Avenue and the surrounding properties to damaging flood waters during minor storm events with high frequency recurrence intervals (2-year storm events or larger). Minor storm events result in a high potential and historical occurrence of the undermining of Pine Avenue. Road washout at this section of Pine Avenue has the potential to damage underground utilities including water lines to the Department of Corrections California Institution for Women, the Inland Empire Utility Agency's Reclamation Plant (RP1) outfall discharge and the Santa Ana Regional Interceptor (SARI) line, on which the region depends to remove salts from the Santa Ana River Watershed. In addition, Southern California Edison 500/220kv electrical transmission lines to the north of the roadway, which service approximately 2.2 million Southern California residents are subject to severe flood conditions, limiting the ability to service the lines for an extended period of time in as moderate as a 2-year storm event.

- Project Goals and Objectives Achieved:

This Project is the result of City planning efforts to design a long-term sustainable system that will have a minimum life span of 50 years, addressing current impacts and planning for the long term urbanization of the area. Through culvert and roadway improvements that have been modeled, designed and constructed for the ultimate build-out of the area, the roadways will require less short term as well as long term maintenance and result in a reduction in the frequency of potential road washout. In addition, flooding conditions to the north where SCE's transmission lines are located will be dramatically decreased through the construction of an earthen channel, designed to increase the expediency at which stormwater is routed away from

the roadway and boundary properties, allowing for continual access to this utility line. The system is designed to manage up to and including a 100-year storm event.

3. Improve Emergency Preparedness and Response and Public Safety

- Current Conditions:

Pine Avenue is a primary east/west arterial between two major north/south roadways, State Route 71 and Interstate 15. East/west traffic in this part of Southern California is particularly congested during peak commuter hours on both freeways and local arterials. Reducing the number of available traffic routes, particularly during heavy commuter times, is associated with the potential to increase emergency response times. Road closures during peak commuter hours, particularly in the east/west direction, present a substantial burden on surrounding arterials.

The nearest major east/west arterial to the south is 5 miles away, and the nearest major east/west arterial to the north is 3 miles away. In its current state, Pine Avenue floods to an unusable and damage inducing state in a 2-year storm event, causing potential emergency service delays to area residents, particularly in the ultimate build out condition. There are additional east/west routes that may be taken; however, they are indirect and often include minimally marked roads through former or current farming properties.

During minor storm events with high frequency recurrence intervals (2-year storm events or larger) there is a high potential and historical occurrence of the undermining of Pine Avenue. There are four major utility lines running beneath the roadway that are subject to damage in the event of a street failure: The Inland Empire Brine Line (formerly known as the Santa Ana Regional Interceptor or "SARI" line), the Inland Empire Utility Agency's Treatment Plant 1 Outfall Line; the water line servicing the California Institution for Women in Chino; and a Natural Gas Line.

The Inland Empire Brine Line ("IEBL") is intended to carry brine and domestic and industrial waste. Currently, it handles domestic sewage from the California Institution for Women and residents within the City of Chino, and also has connections for emergency discharge for the surrounding dairies. In the event of line damage or failure, the resulting sewage leak would pose a regional environmental hazard to wildlife, habitat, the immediate public, and downstream water users.

The Inland Empire Utility Agency's Treatment Plant 1 Outfall Line is owned and maintained by the Inland Empire Utility Agency ("IEUA"). The line conveys recycled water to downstream water users and outflows into El Prado Lake. Prior to discharging into the lake, the water is stripped of its high chlorine content at IEUA's Dechlor facility. A breach of this line would allow chlorinated water to flow directly into El Prado Lake, killing the fish and plant life within the lake.

The water line running under Pine Avenue to the California Institution for Women, a female-only state prison located within the City of Chino, is the only source of water for the prison. Damage to this underlying water line would interrupt all water supplies to the prison. Water service disruption would have a significant impact to the Institution and would cause a relocation of prisoners to another facility.

A road failure has the potential to cause a rupture in the natural gas line running under the roadway. A rupture to this line has a significant impact both locally and regionally. A rupture locally, coupled with a detonation of the high pressure gas main, will likely have an impact area of a quarter mile from the rupture impacting over 250 local residences, the SCE transmission lines, and all circulation in the immediate area. Regionally, the impact would disrupt the service in several counties in Southern California including parts of San Bernardino, Riverside, Orange, and San Diego Counties. The gas transmission line is the southern California natural gas source for a significant number of residential, commercial, and industrial uses within the four county area.

- Project Goals and Objectives Achieved:

The Project will improve public safety through the protection of underground utilities, damage to which could cause potentially catastrophic impacts to the public. The Project will also improve emergency preparedness and response by increasing flood protection, thereby reducing the number of days that Pine Avenue is closed at this location. The improvements being constructed with this Project will increase flood protection and reduce or eliminate the number of days that Pine Avenue is closed at this location due to flooding and "backwater" events. The system is designed to withstand a 100-year storm event in the region's ultimate build-out condition.

4. Improve Water Quality within the Regional Santa Ana Watershed and The Prado Basin

- Current Conditions:

Pine Avenue is located within the Prado Basin, which contains some of the best and largest riparian habitat in Southern California. The Prado Basin also serves as the principle source of groundwater recharge for the Orange County groundwater basin, a primary source of drinking water for Orange County residents. The designated beneficial downstream uses are water contact and non-contact recreation, warm fresh water habitat, wildlife habitat, and habitat for rare, threatened, or endangered species.

The existing drainage course in this area is a shallow and wide non-engineered earthen channel and floodplain that crosses under Pine Avenue through six 30" CMP culverts, which are undersized and cause "backwater" events. Current conditions do not provide for sufficient means to direct the flow before or after the existing undersized culverts, causing erosion inducing turbulence upstream and downstream of the Project which results in sediment

transport to downstream water bodies. Breaching of the dairy waste ponds to the south causes pollutants to be discharged into Prado Lake and ultimately into the Prado Basin.

- Project Goals and Objectives Achieved:

By increasing the flow through and improving the alignment of the earthen channels to the north and south of pine Avenue, and constructing a larger culvert system that conforms to the direction of the natural channel, the potential of "backwater" events and flooding within the Project area is decreased. Reduced flooding and improved storm flow control and conveyance as a result of the Project will reduce erosion and sediment transport to downstream water bodies and reduce the pollutant hazards of breached dairy "ponds", thereby improving regional water resources and protecting natural habitat.

Purpose and Need

Project Purpose:

The purpose of The City of Chino Arterial Flood and Stormwater Management Project is to implement a sustainable flood and stormwater project that will reduce the risk of flooding and flood damages to Pine Avenue, a major east/west arterial in a highly congested area of Southern California, and surrounding properties. Flooding of Pine Avenue causes substantial damage to the roadway and surrounding properties which result in negative affects to regional utilities, public safety, emergency preparedness and response, erosion, and regional water quality.

The Project is designed to achieve the following objectives: (1) improve the region's flood protection by addressing stormwater flood risk at major master planned regional arterials, (2) provide sustainable flood water management systems through the construction of improved stormwater conveyance systems, (3) improve emergency preparedness and response, and (4) improve water quality by reducing pollutant, erosion and sediment transport to the Prado Basin, the primary source of groundwater recharge for downstream water users.

Project Need:

The current Pine Avenue storm drain infrastructure is inadequate to address flood protection needs to protect public infrastructure, provide for adequate emergency preparedness and response, prevent erosion to surrounding property, provide access to local businesses and protect regional water quality. Future planned development will cause a significant increase in the effects of these damaging flood and stormwaters. Implementing this Project will provide for a long term sustainable flood and stormwater management system that will substantially increase flood protection, protect public safety and infrastructure, improve emergency preparedness and response, and support efforts to enhance water quality through the reduction of pollutant, erosion and sediment impacts.

Need for Flood and Stormwater Management

As shown in Exhibit B, this arterial and the surrounding properties are prone to flooding in storm events as minor as a 2-year event, resulting in damage inducing floodwaters crossing the roadway and forcing extended road closures. Exhibit A provides photos of the 2-year event that impacted the roadway in December 2010, illustrating the damaging effects of a comparatively minor storm event. The flooding and resulting damage potential increases substantially in 25-year and 100-year events as shown in Exhibits C and D, respectively. These damaging flood events cause substantial damage to the roadway and surrounding properties, and result in potential negative affects to regional utilities and public safety through potentially life threatening utility failures, increased perilous driving conditions and the impedance of emergency vehicle access.

Need for Sustainable Flood Water Management Systems

The Project is located at a downstream point of an approximate 5,435 acre drainage area. The vast majority of stormwater runoff from this drainage area flows south-southwest, under (or over) Pine Avenue, to El Prado Lake, a 303(d) listed impaired water body, and ultimately to Prado Basin. Road washout at this section of Pine Avenue has the potential to damage underground utilities including water lines to the Department of Corrections California Institution for Women, the Inland Empire Utility Agency's Reclamation Plant (RP1) outfall discharge and the Santa Ana Regional Interceptor (SARI) line, on which the region depends to remove salts from the Santa Ana River Watershed. In addition, SCE's 500/220kv electrical transmission line to the north of the roadway, which services approximately 2.2 million Southern California residents is subject to flooding and impaired access issues.

It is critical that flood and stormwater management Projects be planned and implemented with Regional goals in mind to provide for sustainable systems that will not continue to draw upon local resources for water quality treatment/protection and do not require frequent and costly repairs and upgrades. This Project is the result of City planning efforts to design a long-term sustainable system that will have a life span of 50+ years, addressing current impacts and planning for the long term urbanization of the area.

Need to address water quality impairment

The Prado Basin contains some of the best and largest riparian habitat in Southern California. The Prado Basin also serves as the principle source of recharge for the Orange County groundwater basin, the primary source of drinking water for Orange County. This Project provides for the construction of a portion of the overall stormwater conveyance and regional water quality treatment train (erosion and sediment transport control), which ultimately flows through the Prado Park Lake, a 303(d) listed impaired water body, and ultimately to the Prado Basin.

Stormwater causes overtopping of Pine Avenue and significant erosive conditions to the roadway and surrounding properties. Flood events to the southerly property cause breaching of the dairy "ponds" and increase erosion, which results in sediment and pollutants being carried downstream to the Prado Basin. By increasing the flow through and improving the alignment of the culvert to conform to the direction of the natural channel, the potential of significant erosion in the Project area is decreased, reducing the associated suspended solids and sediment loading in the Prado Basin thereby improving regional water resources and protecting natural habitat.

Current Project Status and Completed Work

Work Completed / Expected to be Completed before August 15, 2013:

CATEGORY	SUMMARY OF COMPLETED WORK
Task 1: a) Project Administration	Project administration completed to date includes identification of the Project need; coordination with the Santa Ana Watershed Project Authority for consistency with and inclusion in the Regional IRWM; project management for the planning and design tasks
Task 2: Land purchase / Easement	Land Purchase / Easements are currently under development. Preliminary legal descriptions are being prepared; preliminary contact with property owner to the south has been initiated;
Task 3: Reporting	Not applicable in the pre-construction phase
Task 4: Assessment and Evaluation	Technical studies have been completed under the City of Chino Specific Plan and were adopted by City Council on March 25, 2003. The Master Plan of Drainage is the primary technical study evaluating the stromwater and flooding protection needed for the City of Chino Preserve Specific Plan.
Task 5: Final Design	90% design plans are complete and are submitted with this application. Final design will be complete by February 2014.
Task 6: Environmental Documentation	California Environmental Quality Act (CEQA) documentation was completed under the City of Chino Preserve Specific Plan and adopted by City Council on March 25, 2003. A copy of the document is included with this grant application. The Pine Avenue storm drains are a part of the City of Chino Master Plan of Drainage within the Preserve Specific Plan & EIR. The City of Chino Preserve EIR addresses the CEQA documentation under which this project is being constructed.
Task 7: Permitting	Preparation of permitting is pending completion of final design documents. Required environmental permits: Clean Water Act Section 404 Permit; Section 1600 Streambed Alteration Agreement; Section 401 Water Quality Certification
Task 8: Construction Contracting	Pending construction document completion
Task 9: Construction	Pending construction document completion and construction contract issuance
Task 10: Environmental Compliance / Mitigation / Enhancement	Environmental compliance tasks have been identified and are focused primarily towards meeting NPDES requirements and monitoring as well as the protection of sensitive/endangered species during construction. Environmental compliance activities will recommence upon final design completion.
Task 11: Construction Administration	Construction administration will commence upon Project ground breaking.

Existing Data and Studies

1. **The Preserve – Chino Sphere of Influence – Area 2 EIR**

Status: Approved March 2003.

The Council Resolution adopting The Preserve EIR as well as the Section of the EIR that specifically addresses the storm drainage improvements required is attached herein as Exhibit H. Please note that this EIR fulfills CEQA requirements for this project and no further review is required.

2. **Master Plan of Drainage Chino Agricultural Preserve Area**

Status: Approved October 2003.

While the Preserve EIR addresses the environmental impacts of the improvements, The Master Plan of Drainage provides the technical analysis and conclusions as to the drainage improvements required and is attached herein as Exhibit I. See Figure 5 of the Master Plan of Drainage for the Master Plan facilities required. This Project is a part of Subarea J.

3. **The Preserve Specific Plan**

Status: Approved March 2003.

4. **The Preserve Specific Plan Amendment**

Status: Approved January 2009.

Project Specifics

The City of Chino Arterial Flood and Stormwater Management Project is **not** part of State Plan of Flood Control (SPFC) as defined in Section III and Appendix B of the November 2012 Guidelines. The Project is located in the City of Chino, County of San Bernardino, in Southern California (see Exhibit E – Project Map). No element of this Project is part of the Sacramento River Flood Control Project or the Sacramento River or the San Joaquin River watersheds.

Project Timing and Phasing

While this Project is included in the Regional IRWM and the City of Chino Preserve Natural Treatment System Master Plan, it is a standalone Project.

Proposed Work

Work Plan Outline
Category (a): Direct Project Administration Costs
Task 1: Administration ▪ **Project Administration –** Progress, budget, and schedule tracking, evaluation, and management. ▪ **Project Communications / Public Relations Program –** Agency, stakeholder, and community / business outreach, project communications tools, emergency contact list and procedures, project roles & responsibility matrix. ▪ **Project Status Report –** Progress, budget and schedule tracking, project status evaluation and recommended actions. **Deliverables: Preparation of invoices, and other deliverables as required.** **Status:** Current efforts are focused towards Project Administration components. Project Communications and Public Relations Program are anticipated to be addressed during following the Grant Agreement execution**.**
Task 2: Labor Compliance Program ▪ **Labor Compliance Program Development –** Definition of current DIR labor classifications with construction trades required for project, Agency review organization, reporting requirements to meet City of Chino requirements, State and Federal Requirements**.** ▪ **Construction Documents Labor Compliance Program –** Define labor compliance reporting methodology and enforcement including certified payroll review, labor benefits formats, interview schedule. Preparation, Submission, and review of Program to Department of Water Resources. **Deliverables: Submission of Labor Compliance Program.** **Status:** Labor Compliance Program is anticipated to be addressed during the development of Project Construction Documents following the Grant Agreement execution.
Task 3: Reporting ▪ **Grant Administration Program –** Management of Grant Agreement, reporting format and schedule management for Grant deliverables**.** ▪ **Grant Administration Report (Quarterly, Annual & Final Reports)** **Deliverables: Submission of quarterly, annual, and final reports as specified in Grant Agreement.** **Status:** Project Reporting anticipated at the development of each task based on the project schedule and is anticipated to be addressed following the Grant Agreement execution.
Category (b): Land Purchase / Easement
▪ **Pine Avenue Right of Way / Temporary Construction Easement –** Right of Way and Temporary Construction Easement on Barthelemy Property for storm drain easement and construction operations on the south side of Pine Avenue. ▪ **Southern California Edison Facilities Relocation Agreement –** City of Chino to develop a Work

Work Plan Outline
Order for relocation of distribution facilities along north of Pine Avenue and associated Transmission easement consents for crossing. Current research indicates minimal areas of impact. **Deliverables: Rights of Way, Easements, Consents, and Relocations listed above.** **Status:** Land Purchase / Easements currently under development with preliminary legal descriptions being prepared and preliminary contact with property owners initiated. SCE work orders for relocations, consents, and grantouts under way. Property / Easement appraisals not currently initiated.
Category (c): Planning / Design / Engineering / Environmental Documentation
Task 4: Assessment and Evaluation - Completed **Deliverables : Technical Studies & Specific Plan EIR** **Status:** All environmental studies completed under the City of Chino Specific Plan, adopted by City Council on March 25, 2003.
Task 5: Final Design ▪ **Civil Engineering Final Design –** Final design addressing ultimate crossing and adjoining channels, grading, underground and storm drainage structures and conveyance systems, energy dissipation structures, relocation or undergrounding of SCE distribution facilities, partial street improvements (existing 2 lane configuration) to construct the crossing and raise Pine Avenue outside of the flood plain to match the Drainage and Street Master Plans. ▪ **Project Specifications –** Final design specifications to be developed following current design review. **Deliverables: Completed Construction Plans and Specifications.** **Status:** Final design ongoing with overall design at 90% completion and under review for plan checking.
Task 6: Environmental Documentation - Completed ▪ **CEQA Document –** City of Chino Preserve Specific Plan EIR. **Deliverables: Approved and adopted CEQA documentation.** **Status:** City of Chino Preserve Specific Plan EIR adopted by City Council on March 25, 2003.
Task 7: Permitting ▪ Regulatory Agency Permits required include the following: Sections 404 Permit, 1602 Permit, 401 Permit from USACE, Cal Fish & Wildlife, Santa Ana Water Quality Control Regional Board. **Deliverables: Environmental Permits as noted above.** **Status:** Preparation of permitting pending completion of final design documents.
Category (d): Construction / Implementation
Task 8: Construction Contracting ▪ Development of Construction Agreement and front end bidding instructions.

Work Plan Outline

- Project Advertisement for Bids & Pre-Bid Conference
- Public Bid Opening
- Evaluation of Bids, Determination of Lowest Responsive Responsible Bidder.
- Contract Award

Deliverables: Advertisement for Bids, pre-bid contractor meeting, evaluation of bids, award contract.
Status: Pending Construction Documents completion**.**

Task 9: Construction

The Project includes the construction of over 1,000 linear feet of reinforced concrete box, over 450 linear feet of earthen channel, storm drain, dry utility relocation, and street improvements (restoring the existing two lane roadway).

Task 9.1 Mobilization and Site Preparation

- Contractor equipment mobilization.
- Construction boundary survey with potholing and the use of Underground Service Alert.
- Site preparation including setting up of temporary staging areas for contractor, and equipment and material storage, installation of temporary barricades, fencing
- Installation of traffic warning and control for motorists.

Task 9.2 Project Construction

Sequence of construction operations based on construction window for flood control facility connections and circulation requirements for existing property owners and commuting traffic. Elements of construction are listed below:

- Pine Avenue detour bypass temporary road.
- Clearing & grubbing of site and removal of existing roadway.
- Temporary bypass of storm flows and protection of SARI Line as well as Underground Utilities. (as necessary to protect systems functioning)
- Dry Utility Relocations of Distribution Lines.
- Storm drain 12x4 triple RCB culvert installation and backfill.
- Grading of approach earthen channel connecting to crossing.
- Storm Drain Energy Dissipation Structures Installation.
- Storm drain 84" RCP installation and backfill.
- Pine Avenue grading and transition to existing adjacent properties.
- Street roadway construction (restoration of two lane existing lane configuration.
- Removal of temporary road bypass.

Task 9.3 Performance Testing and Demobilization

- Contractor equipment demobilization appropriately and most cost effectively with equipment remaining on site only as required.
- Project performance testing linked to removal of damaging surface storm drain flow and reduction in flood damage, improved emergency response, reduction in sediment transportation load and the associated improvement of water quality.

Work Plan Outline

Deliverables: As built, Inspection Reports & Materials Testing Certifications..
Status: Pending Construction completion**.**

Category (e): Environmental Compliance / Mitigation / Enhancement

Task 10: Environmental Compliance / Mitigation / Enhancement

Environmental Compliance is focused in the short term towards meeting NPDES requirements and monitoring as well as protecting sensitive species for construction activities. Long term compliance will address the monitoring of water quality results through the implementation of City of Chino Preserve MS4 NTS Master Plan.

Deliverables: NPDES Compliance Reports under SWPPP.
Status: Pending Construction completion**.**

Budget Category (f): Construction Administration

Task 11: Construction Administration

Construction Administration includes the following elements:

- Public / Community Outreach (Communications Plan)
- Contract Administration including construction progress monitoring, progress payment processing, change order management, RFI requests, contract document changes, performance and labor bond management
- Inspection, Materials Testing, Quality Control Monitoring
- Construction storm water compliance Monitoring

Deliverables: Approved contractor invoices, Inspection reports, Construction Management Reports, Submittal & RFI Log.
Status: Pending Construction completion**.**

Exhibit A – Project Area Photos in a 2-year Event (December 2010)

Pine Avenue Roadway Failure

Existing Outfall
December 2010 (2-year event)

Pine Avenue Existing Outfall and Storm Response Activities
December 2010 (2-year event)

Pine Avenue Storm Response Activities
December 2010 (2-year event)

Exhibit B – HEC-RAS Exhibit (2-year event)

STA 11
WSE=568.59

STA 10
WSE=568.42

STA 9
WSE=567.25

STA 8
WSE=566.82

STA 7
WSE=565.81

STA 6
WSE=565.84

STA 5
WSE=565.83

STA 4.9
WSE=565.82

STA 4.1
WSE=558.36

STA 4
WSE=558.34

STA 3
WSE=557.87

STA 2
WSE=556.86

STA 1
WSE=556.33

Q2 = 324 cfs

SOUTHERN CALIFORNIA EDISON EASEMENT

EXISTING 6-30" CSP SD

Overflow Elev.=565.8

EXISTING DAIRY BASIN
WSE AT DAIRY BASIN=562.5
SOUTHERLY BERM OVERFLOW
ELEV.=562.5

RINCON MEADOW AVE.

PINE AVE.

5.0%

1.6%

1.0%

1.0%

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

L.D. KING, INC.
2151 CONVENTION CENTER WAY
SUITE 100
ONTARIO, CA 91764
(909) 937-0200

CHANNEL HYDRAULIC ANALYSIS FOR EXISTING CONDITION 2-YEAR FREQUENCY

PROJECT NO.

SHEET 1 OF 1

JN 481125 Lewis Operating Corp. E:\400-499\481\0481-125\PLANS\hydro\HEC-RAS\HEC-RAS-EXIST-2YR.dwg, Plotted: Jan 29, 2013 - 4:31pm

Exhibit C – HEC-RAS Exhibit (25-year event)

STA 11
WSE=570.73

STA 10
WSE=570.55

STA 9
WSE=569.02

STA 8
WSE=567.09

STA 7
WSE=566.40

STA 6
WSE=566.45

STA 5
WSE=566.42

STA 4.9
WSE=566.41

STA 4.1
WSE=560.25

STA 4
WSE=559.34

STA 3
WSE=559.51

STA 2
WSE=559.03

STA 1
WSE=558.52

WATER LEVEL
572.0

WATER LEVEL
569.6

WATER LEVEL
566.2

Q2 = 889 cfs

SOUTHERN CALIFORNIA EDISON EASEMENT

EXISTING 6-30" CSP SD

Overflow Elev.=566.4

EXISTING DAIRY BASIN
WSE AT DAIRY BASIN=562.5
SOUTHERLY BERM OVERFLOW
ELEV.=562.5

RINCON MEADOW AVE.

PINE AVE.

5.0%

1.6%

1.0%

1.0%

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LDKING
L.D. KING, INC.
2151 CONVENTION CENTER WAY
SUITE 100
ONTARIO, CA 91764
(909) 937-0200

CHANNEL HYDRAULIC ANALYSIS FOR EXISTING CONDITION 25-YEAR FREQUENCY

PROJECT NO.

SHEET 1 OF 1

JN 481125 Lewis Operating Corp. E:\400-499\481\0481-125\PLANS\hydro\HEC-RAS\HEC-RAS-EXIST-25YR.dwg, Plotted: Jan 29, 2013 - 4:21pm

Exhibit D – HEC-RAS Exhibit (100-year event)

STA 11
WSE=571.34

STA 10
WSE=571.14

STA 9
WSE=570.23

STA 8
WSE=566.84

STA 7
WSE=566.82

Q_2 = 1455 cfs

STA 6
WSE=566.78

STA 5
WSE=566.73

STA 4.9
WSE=566.72

STA 4.1
WSE=562.16

STA 4
WSE=559.88

STA 3
WSE=560.08

STA 2
WSE=559.60

STA 1
WSE=559.12

SOUTHERN CALIFORNIA EDISON EASEMENT

EXISTING 6-30" CSP SD

Overflow Elev.=566.7

EXISTING DAIRY BASIN
WSE AT DAIRY BASIN=562.5
SOUTHERLY BERM OVERFLOW
ELEV.=562.5

WATER LEVEL 572.0

WATER LEVEL 569.6

WATER LEVEL 566.2

RINCON MEADOW AVE.

PINE AVE.

5.0%

1.6%

1.0%

1.0%

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LDKING
L.D. KING, INC.
2151 CONVENTION CENTER WAY
SUITE 100
ONTARIO, CA 91764
(909) 937-0200

CHANNEL HYDRAULIC ANALYSIS FOR EXISTING CONDITION 100-YEAR FREQUENCY

PROJECT NO.

SHEET 1 OF 1

JN 481125 Lewis Operating Corp. E:\400-499\481\0481-125\PLANS\hydro\HEC-RAS\HEC-RAS\HEC-RAS\EXIST-100YR.dwg, Plotted: Jan 29, 2013 - 4:14pm

Exhibit E – Project Area Map

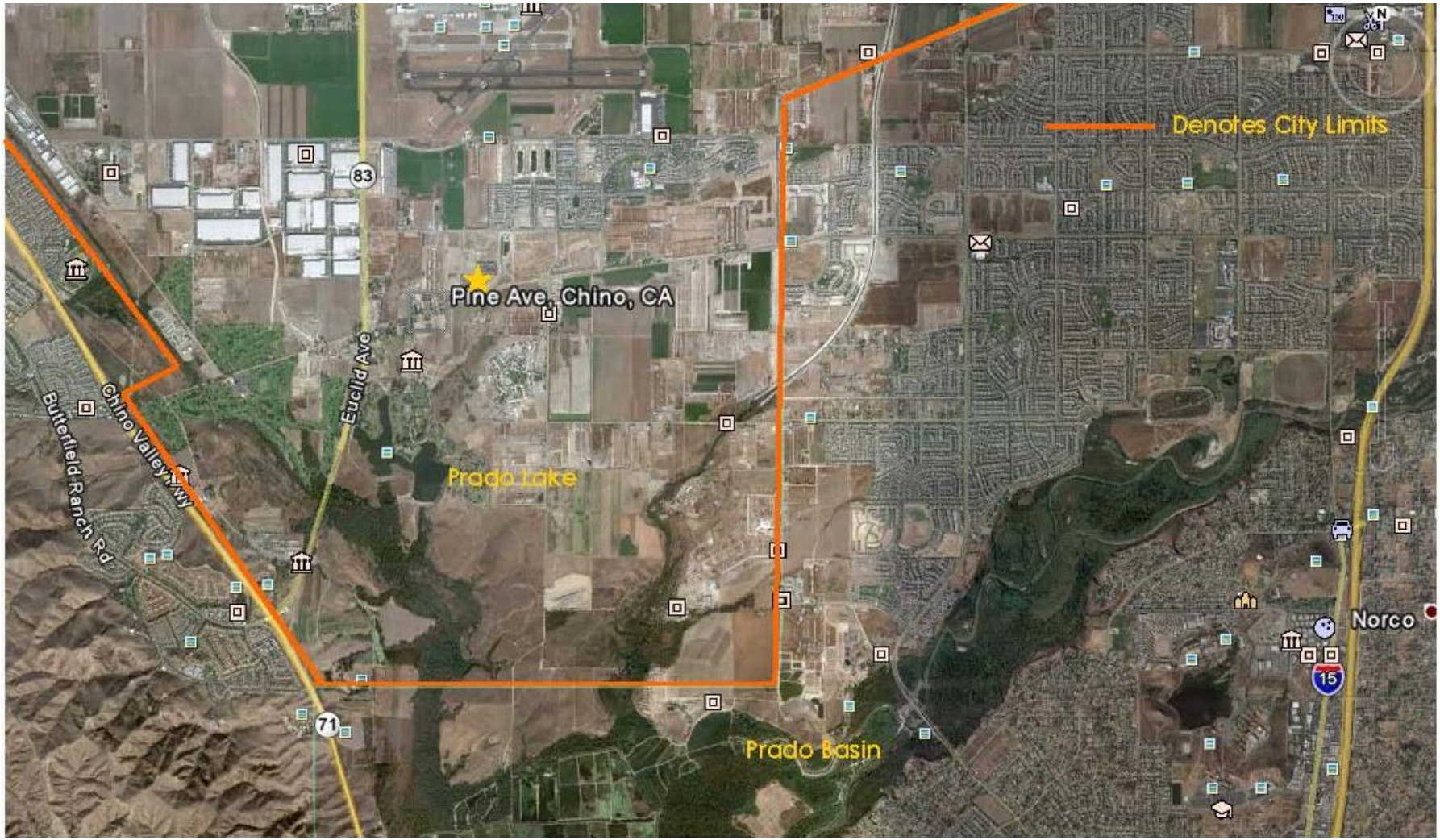

Exhibit F – Temporary Construction Detour Plan

SOUTHERN CALIFORNIA EDISON EASEMENT
195'
LOT 12
N.A.P.
LOT D
ENUE
TRACT 17571 BOUNDARY
LIMITS OF GRADING
EX. R/W
METER VAULT
SCE TOWER

Exhibit G – Project Design Plans – 90% Completion

1

2

3

4

5

6

7

8

9

10

11

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Exhibit H – The Preserve Master Plan EIR Resolution and Excerpt

ORIG:Vault XC:D.Moore(CD);Public Review 3/26/03 klb

RESOLUTION NO. 2003-15

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CHINO, CALIFORNIA, CERTIFYING THE PROGRAM ENVIRONMENTAL IMPACT REPORT, ADOPTING ENVIRONMENTAL FINDINGS PURSUANT TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, A STATEMENT OF OVERRIDING CONSIDERATIONS, AND A MITIGATION, MONITORING AND REPORTING PROGRAM FOR THE PRESERVE

Section 1. Recitals

WHEREAS, in 2000 the City of Chino initiated the preparation of a Program Environmental Impact Report (PEIR), General Plan Amendment (The Preserve Area Plan) and The Preserve Specific Plan (prezone and zone) ("The Project") as legally described in Exhibit "A" attached; and

WHEREAS, pursuant to the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.), the State of California CEQA guidelines (14 CCR Section 15,000 et seq.), and the City of Chino's Local CEQA Guidelines, the City of Chino is the lead agency for the Project; and

WHEREAS, the City of Chino, as the lead agency, determined that an Environmental Impact Report (EIR) should be prepared pursuant to CEQA in order to analyze all potential adverse environmental impacts of The Project; and

WHEREAS, five focus group workshops to solicit input on various topics for the Master Plan and the PEIR were held between March 15, 2000 and June 7, 2000; and

WHEREAS, the focus groups included Environmental Issues, Infrastructure and Services, Transportation and Mobility, Property Owner interests, and review of Alternative Land Use Plan Concepts; and

WHEREAS, beyond these workshops, comments on alternative master plan concepts and environmental issues were also received by the City of Chino at a series of Joint City Council/Planning Commission Workshops, held on June 14, August 16, October 17, 2000 and October 23, 2001; and

WHEREAS, an Environmental Impact Report (EIR) Notice of Preparation (NOP) was distributed on December 5, 2000, via certified mail to agencies and other interested parties to solicit comments and inform the public of the proposed project; and

WHEREAS, the public was invited to review the NOP and comment on the issues discussed; and

WHEREAS, subsequently, an amended NOP was issued on January 5, 2001 to reflect an increase in the total number of residential units proposed within the project area; and

WHEREAS, pursuant to Public Resources Code Section 21092, the City of Chino also provided a Notice of Completion (NOC) and Notice of Availability (NOA) to all organizations and individuals who had previously requested such notice in writing, and published the Notice of

Completion exceeding the CEQA requirement of publishing in only a newspaper of general circulation; and

WHEREAS, the City of Chino published a NOC and NOA in three newspapers (The Press Enterprise, The Chino Champion, a newspaper of general circulation, and The Daily Bulletin); and

WHEREAS, the Draft Environmental Impact Report (DEIR) was circulated for a 45-day public review period from September 14 to November 1, 2001; and

WHEREAS, subsequent to the DEIR public review the City of Chino partially recirculated three sections (water, biological resources, and transportation and circulation) of the DEIR; and

WHEREAS, the availability of the partially recirculated DEIR (PDEIR) was published in the same three newspapers and the document was circulated for an additional 45 day public review period from August 2, 2002 to September 16, 2002; and

WHEREAS, as required by California Environmental Quality Act Section 15132, a Final EIR has been prepared responding to comments on significant environmental points raised in the review and consultation process of the Environmental Impact Report; and

WHEREAS, the City of Chino, as part of the PEIR, has prepared a Resources Management Plan; and

WHEREAS, the purpose of the Resources Management Plan is to provide a framework to ensure compliance with the EIR, to ensure adequate reporting and monitoring, and to provide a detailed methodology for implementing the biological resources mitigation measures contained in the PEIR, and

WHEREAS, pursuant to Public Resources Code Section 21092.5, the City of Chino provided written response to comments by mailing certified copies on January 31, 2003; the Resources Management Plan and Final Environmental Impact Report Response to Comments were made available to all agencies and parties that commented on the DEIR and PDEIR; and

WHEREAS, the Planning Commission held a public hearing on February 24, 2003, concerning the proposed project, and received and considered public testimony; and

WHEREAS, the Planning Commission on February 24, 2003, recommended the City Council to certify the Program Environmental Impact Report and adopted Resolution 2003-07; and

WHEREAS, the City Council on March 11, 2003, and continued to March 25, 2003, held a noticed public hearing and all interested parties were heard; and

WHEREAS, prior to taking action, the City Council has heard, been presented with, reviewed and considered all of the information and data in the administrative record, including the Final EIR and all oral and written evidence presented to it during the hearing; and

WHEREAS, all of the findings and conclusions made by the City Council pursuant to this resolution are based upon oral and written evidence presented to it as a whole and not based solely on the information provided in this Resolution; and

WHEREAS, all provisions of the California Government Code and Chino Municipal Code related to the proposed project have been complied with, including noticed public hearings; and

WHEREAS, the City Council has considered and clearly established the following findings of fact:

1. The Initial Study, Resources Management Plan and Program Environmental Impact Report for The Preserve have been prepared in compliance with the California Environmental Quality Act (CEQA).

2. The proposed project has been altered to avoid or substantially lessen significant impacts identified in the Final EIR.

3. Specific social, economic or other concerns render other mitigation measures or alternatives to the project infeasible.

NOW, THEREFORE, BE IT RESOLVED, THE CITY COUNCIL OF THE CITY OF CHINO, CALIFORNIA, DOES HEREBY FIND, DETERMINE AND RESOLVE AS FOLLOWS:

Section 2. Findings

At a special meeting assembled on March 11, 2003, and continued to March 25, 2003, the City Council determined that based on all of the evidence presented, including the Final EIR, written and oral testimony given at meetings and hearings, and submission of testimony from the public organizations and regulatory agencies, the following environmental impacts associated with The Project are: 1) less than significant and do not require mitigation; or 2) potentially significant and each of these impacts will be avoided or reduced to a less than significant level through identified and feasible mitigation measures; or 3) significant and will be lessened by the identified and feasible mitigation measures.

Section 3. Statement of Overriding Considerations

Pursuant to State CEQA Guidelines Section 15093, the City Council must balance the benefits of The Project against any unavoidable environmental impacts in determining whether to approve The Project. If the benefits of The Project outweigh the unavoidable adverse environmental impacts, those impacts may be considered "acceptable." Therefore, the City Council hereby adopts the Findings and Reasons stated, and Statement of Overriding Considerations attached to this resolution as Exhibit "B" and Exhibit "C", respectively.

Section 4. Mitigation Monitoring and Reporting Plan

The City Council hereby adopts the Mitigation Monitoring and Reporting Plan attached to this resolution as Exhibit "D".

Section 5. Custodian of Records

The documents and materials that constitute the records of proceedings in which these findings have been based are located at the Community Development Department, City of Chino City Hall, 13220 Central Avenue, Chino, California. The custodian for these records is the Director of Community Development. This information is provided in compliance with the Public Resources Code Section 21081.6.

Section 6 Certification of Program Environmental Impact Report

The City Council hereby directs staff to file a Notice of Determination within 5 days from the certification of the Program Environmental Impact Report.

The Mayor shall sign this resolution and the City Clerk shall attest and certify the passage and adoption thereof.

NOW, THEREFORE, BE IT FURTHER RESOLVED, THE CITY COUNCIL OF THE CITY OF CHINO, CALIFORNIA, DOES HEREBY FIND, DETERMINE AND RESOLVE AS FOLLOWS:

1. The City of Chino City Council certifies the Program Environmental Impact Report, Statement of Overriding Considerations, Mitigation Monitoring Program, and Resources Management Plan for The Preserve Area Plan General Plan Amendment 2000-02, The Preserve Specific Plan and Prezone No. 2003-01, and other land use actions and approvals as noted in section 4 of the Final Environmental Impact Report.

APPROVED AND ADOPTED THIS 25th DAY OF MARCH 2003.

EUNICE M. ULLOA, MAYOR

ATTEST:

LENNA J. TANNER, CITY CLERK

State of California)
County of San Bernardino) §
City of Chino)

I, Lenna J. Tanner, City Clerk of the City of Chino, do hereby certify that the foregoing Resolution of the City of Chino was duly adopted by the Chino City Council at a meeting held on the 25th day of March 2003, by the following votes:

AYES: COUNCIL MEMBERS: ULLOA, DUNCAN, ELROD, HAUGHEY, YATES

NOES: COUNCIL MEMBERS: NONE

ABSENT: COUNCIL MEMBERS: NONE

Lenna J. Tanner

LENNA J. TANNER, CITY CLERK

5.3 HYDROLOGY AND WATER QUALITY

5.3.1 INTRODUCTION

This section describes regional and local hydrology, and evaluates the impacts of the proposed project on drainage, flood control, groundwater resources, and surface and groundwater quality.

5.3.2 EXISTING CONDITIONS

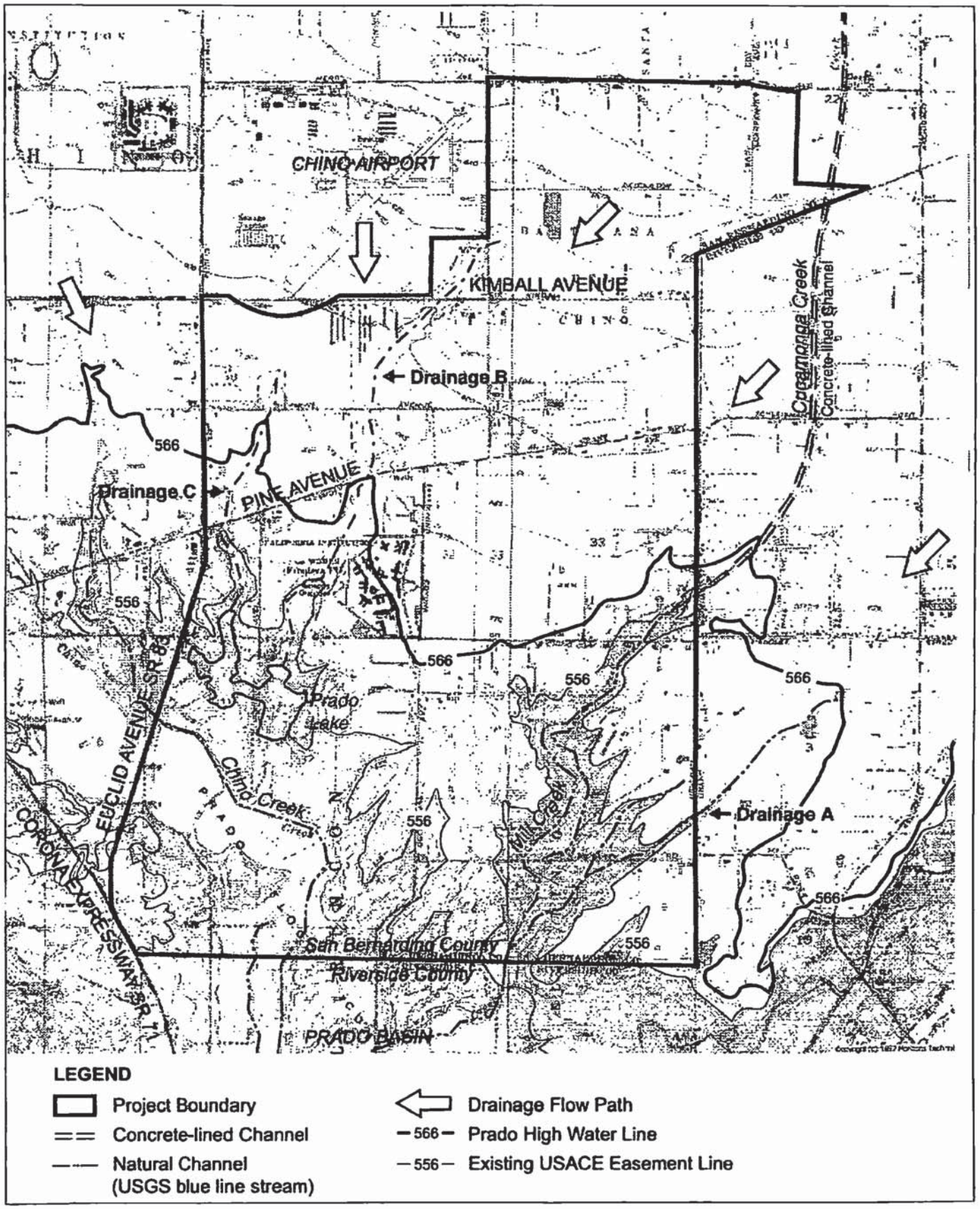
Flooding and Inundation

Surface Runoff and Drainage Characteristics

The proposed plan area is located on the broad, gentle sloping alluvial plain of the Chino Basin. The principal drainage course of the lower Chino Basin is the Santa Ana River (SAR), located south of the plan area within the Prado Flood Control Basin. The Santa Ana River watershed encompasses 2,650 square miles, within which the SAR extends some 69 miles from its headwaters in the San Bernardino Mountains to its outlet at the Pacific Ocean. The Santa Ana River enters the Chino Basin at the Riverside Narrows and flows along the southern boundary to the Prado Basin where it is eventually discharged through the outlet at Prado Dam. Two principal tributaries to the SAR flow through the plan area—Chino Creek and Mill Creek. The plan area is also traversed by several ephemeral and seasonal drainages, and is subject to extensive sheet flow during major storm events. These flows are ultimately conveyed via either Chino Creek or Mill Creek to the Santa Ana River at Prado Basin.

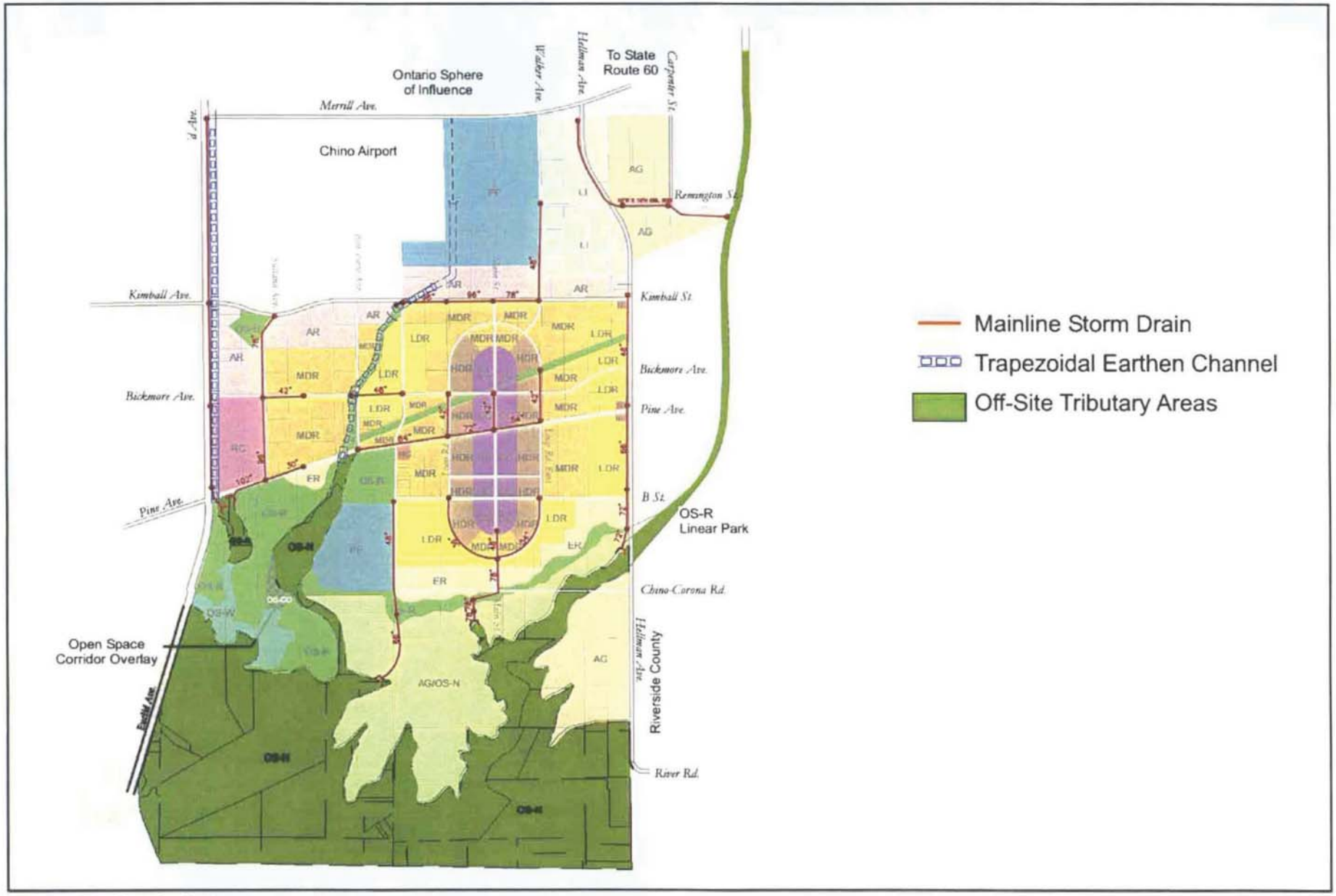
The plan area contains five distinct north/south concentrated drainage paths, three of which are indicated as blueline streams on the USGS map (Exhibit 5.3-1). The most easterly of the blueline streams (Drainage A) is an unnamed tributary to Mill Creek which receives sheet flow from dairy lands located south of Chandler Street and east of Hellman Avenue, and carries flows in a natural channel to a confluence with Mill Creek. The next system westward, Mill Creek, receives flow from Cucamonga Creek channel (49,000 CFS capacity), a concrete-lined trapezoidal channel which handles storm water flows from the City of Ontario and City of Ontario General Plan Amendment (GPA) area (i.e. 'New Model Colony') to the north. Mill Creek also receives sheet flow from immediately surrounding agricultural and dairy lands.

The third blueline stream is Chino Creek (26,400 CFS capacity) which flows along the western boundary of the plan area as a natural channel. Two minor unnamed tributaries to Chino Creek (Drainages B and C) provide surface flow to Prado Lake.



Michael Brandman Associates

Exhibit **5.3-1**
Surface Drainage Features



SOURCE: The Planning Center

NORTH

MAP NOT TO SCALE

Michael Brandman Associates

05760012 · 6/2001

Exhibit **5.3-2**

Storm Drainage Plan

THE PRESERVE • CHINO SUBAREA 2

Sheet flows from the Ontario GPA area, the developing Eastvale community, and flows within the proposed plan area itself, all combine to cause significant localized flooding of earthen swales, curbed roadways and dairies within the plan area during moderate-to-severe storm events. The result is numerous road closures, dairy livestock loss, and overtopping or breaches of dairy water retention ponds.

Master Plans of Drainage (MPD) have been developed by San Bernardino County Flood Control District, and the cities of Chino and Ontario to address flooding problems within their respective jurisdictions.

Other collaborative agency initiatives are underway to address flood control and related water quality problems in the Chino Basin Dairy Area (CBDA) and proposed plan area.[1] Participating agencies include Inland Empire Utilities Agency (IEUA), the USDA-Natural Resources Conservation Service (NRCS), San Bernardino County Flood Control District, Orange County Water District and others.

Plans and projects include, but are not limited to the IEUA Organics Management Center (see Dairy Waste Management in Section 5.12), Emergency Watershed Protection (EWP) planning to clean up manure and provide flood control, a Storm Water Management Demonstration Project for Chino Creek, and a Debris Removal/Water Quality Restoration Project for Mill Creek. Implementation of these programs and projects will help to alleviate current flooding conditions and water quality problems within the proposed plan area.

Santa Ana River Mainstem Project - Prado Dam

Prado Dam is a compacted earth-filled embankment with a current spillway crest elevation of 543 feet above mean sea level (MSL). In 1988, pursuant to the Santa Ana River Mainstem and Prado Dam projects, the U.S. Army Corps of Engineers (USACE) approved structural revisions to raise the spillway crest elevation by 20 feet to 563 feet, and revisions to raise the dam structure 28.6 feet to a design water surface elevation of 566 feet. These improvements to the dam and the associated spillway are scheduled for completion in 2008. The raised dam is designed to accommodate a 200-year flood event.

Approximately 53% of the proposed plan area lies within the 566 foot elevation area subject to inundation from these planned Prado Dam improvements. Approximately 25% of the proposed plan area is within the 556 foot elevation, which is the current Corps of Engineers Easement and Fee Line (i.e. the 556 ft. 'take' line). This includes properties already owned or encumbered by the Corps of Engineers. Currently, the southwest portion of the plan area floods to an elevation of approximately

[1] Santa Ana River Watershed Group (6/01).

505 feet annually. Although the proposed Prado Dam improvements are principally designed for flood control purposes, the project also includes water conservation, recreation, and more recently, endangered species habitat conservation objectives.

History of the Prado Dam

The idea of a dam on the Santa Ana River was seriously considered following the major flood of 1916. Studies were considered on a number of occasions, but the concept of the Prado Dam took its ultimate form following the flood of 1927. The Orange County Flood Control District (OCFCD) in 1938, following another major flood that year, began acquiring the properties behind the dam site to an elevation of 556 feet above sea level, the ultimate maximum height of the flood control basin.

This extent of property acquisition involved controversy with the land owners, and at the end of 1939, the USACE took over the efforts to complete the remaining land acquisitions and condemnations necessary to secure all outstanding fee titles to land. The crest of the constructed dam had an elevation of 566 feet and the top of the spillway was at 543 feet. The flood control basin covered 9,741 acres, and this included the town of Rincon, the railroad tracks, and numerous local farmsteads of the region. Many of the existing wood-frame houses and barns were removed and publicly sold by the government. The construction contract for the earth-filled dam was awarded in September 1938, and the work was completed by May 1941. The dam and reservoir have been managed ever since its completion by the USACE. Under USACE management, tracts within the flood control basin have been leased for dairy agricultural operation, or for recreational activities (see Section 5.1 Land Use).

In the mid-1970's an agreement was made to increase the flood control capacity of Prado Dam by increasing the dam height by about thirty feet and raising the spillway outlet elevation 563 feet. A new property 'take' line agreement was established which increased the reservoir basin to cover the lands behind the dam to an elevation of 566 feet. . In the 1980's, cultural resource studies were begun to address Federal cultural resource planning requirements for all properties up to the 566-foot elevation take line.

In the late-1990's, agreements between the USACE, Orange County Water District (OCWD), and the United States Fish and Wildlife Service (USFWS) established criteria for Prado Dam operations that balance flood control, water conservation and endangered species protection objectives. The *Water Control Manual for the Prado Basin* (1994) defines how the dam is to be operated at various times of year to achieve flood control, water conservation and environmental protection functions. Currently, an annual backhold elevation of 505 feet is established for Prado Basin during the water conservation period (March 1st to September 30th), to meet endangered species objectives within the Basin. The release rate during this period is established at 200-600 CFS in order to provide year-round flow to OCWD's water recharge facilities located downstream. During the flood season (October 1st - February 28th), the Prado Dam release rate is controlled at 2,500 CFS up to the 520 elevation in order

to match the capacity of the downstream channel facility. However, when the backhold elevation rises above the 520 elevation, release rates can increase to 5,000 CFS to limit localized flooding within the Basin area.

OCWD has initiated a request to alter the water conservation program for Prado Basin[2] to further increase water available for downstream groundwater recharge. OCWD proposes extending the water conservation period to year-round and altering the current 505 backhold elevation criteria to increase dam outflow. The proposal is currently under evaluation by the USACE.

Prado Dam Real Property Acquisition Program

In 1989 the USACE, and three local sponsors – The Riverside County Flood Control and Water Conservation District (RCFCD), the San Bernardino County Flood Control District (SBCFD), and the OCFCD entered into a Local Cooperation Agreement (LCA) for the Santa Ana River Mainstem (SAR) Project. There are several components or features of the SAR project, including raising Prado Dam and spillway and constructing various dikes in the Prado Dam reservoir basin. Under the terms of the LCA, the OCFCD is to acquire property rights between the 556-foot and 566-foot elevations required for the Prado Dam improvements feature of the project. This acquisition program involves purchasing the right to flood property up to 566' in the Prado Dam reservoir basin.

The OCFCD may acquire parcels in fee or acquire a flowage easement, depending on the potential impact of the Prado Dam project on a parcel, and consideration of long-term operation of the dam and associated management of the reservoir basin. The USACE determines what land uses that are consistent with local zoning can occur on property purchased by the OCFCD. The primary criterion is that there can be no habitable structures or permanent human habitation below 566 feet. Determinations on which parcels are impacted, and the type of rights to be acquired, are subject to more specific engineering, surveying and related studies.

Current Status of Program

Approximately 280 ownerships are affected by the Orange County Flood Control District (OCFCD) acquisition program, representing 1,660 acres to be acquired.[3] At the present time, the acquisition program for the Prado Dam feature is focused on individually assessed hardship applications. Within the proposed plan area, six parcels totaling 57 acres have been acquired by OCFCD. Also within the plan area, 37 parcels totaling approximately 985 acres are classified as 'property most impacted', and are yet to be acquired. An additional 90 acres are classified as 'under study' for acquisition, and up to 100 additional acres located just below the 566-foot elevation are classified as 'lesser impacted

[2] Prado Dam Water Conservation and Supply Study, U.S. Army Corps of Engineers. 1999.

[3] Proposed Prado Dam Project; County of Orange Public Facilities & Resources Department (10/23/00)

property'. The USACE and OCFCD continue to study alternatives, design construction phasing and financial plans.

Offset Flood Volume Mitigation

The U.S. Army Corps of Engineers has authority to require offset volume mitigation for any project that would result in reduced flood capacity within the 566-foot elevation. Examples where this approach has occurred or is planned include IEUA's Regional Plant-5 within Chino Subarea 1, and USACE projects to provide stabilization of the Norco Bluffs and flood protection for existing facilities, uses and structures within the Prado Basin.[4]

USACE proposes stabilization of the toe of the Norco Bluffs by placing a soil cement structure between the toe and the riverbed. Compacted fill would be located between the soil cement structure and bluff slope up to the 100-year flood elevation. Fill would also be placed along several side canyon areas to ensure proper drainage within these areas. A variety of structural improvements are proposed by USACE within the Prado Flood Control Basin, including numerous dikes for protection of existing facilities and uses within the basin. Among these is a proposed dike along the western and southern boundary of the California Institution for Women, within the proposed plan area. To offset the flood capacity lost by placement of these features within the 566 foot inundation area, USACE has identified a borrow site of approximately 17 acres within the proposed plan area near its southerly boundary. Soil material is proposed for removal at this location, for potential use in creating a flood protection dike along the CIW-Chino westerly and southerly boundaries. See Section 5.1 Land Use for additional information on USACE plans within the Prado Flood Control Basin.

Special Flood Hazard Areas

Prado Dam currently retains floodwaters up to an inundation elevation of 505 feet on an annual basis. The 505-foot elevation is largely confined to the Chino Creek and Mill Creek channels within the plan area. Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRM) also identify portions of the plan area within the 500-year flood plain. In addition, the FIRM maps and the Prado Flood Control Basin Master Plan indicate that 100-year flood-prone areas occur within the plan area in the vicinity of Mills Creek and Chino Creek floodplain below the 550-foot elevation. This essentially encompasses the lower 30% of the plan area.

Groundwater Resources

Chino Basin is one of the largest groundwater basins in southern California with about 5,000,000 acre-ft of water in the underground basin and an unused storage capacity of about 1,000,000 acre-ft.

[4] Supplemental EIS and Project EIR for Prado Basin and Vicinity, Including Stabilization of the Bluff Toe at Norco Bluffs; U.S. Army Corps of Engineers (7/2000).

The basin is an integral part of the regional and statewide water supply system, and is identified as a critical component in solving state water needs and managing inter-state shortfalls of available water from the Colorado River and the Bay-Delta[5]. Various water agencies, including Chino Basin Water Master, Inland Empire Utility Agency (IEUA), and other water supply entities produce groundwater for municipal and industrial supplies within the basin, and about 300 to 400 agricultural users produce groundwater from the basin for local use. It is estimated that the 270 dairies within the Chino Basin Dairy Area pump approximately 40,000 acre-feet of water from the underground basin annually.[6]

Chino Basin groundwater contributes to surface flows in the Santa Ana River (SAR), as significant quantities of Chino Basin groundwater rise to the surface and enter the Santa Ana River within the Prado Basin south of the plan area. The SAR is the primary source of groundwater recharge for the Lower Santa Ana Basin, which supplies approximately 63% of Orange County's water needs.

The proposed project area (i.e. the 'plan area') overlies Sub-basin II of the Chino Groundwater Basin. Several municipal groundwater production wells are located along Kimball Avenue and Remington Avenue at the northern limits of the plan area. Numerous private wells associated with agricultural uses are also located within the plan area.

Water Quality and Dairy Wastes

The Chino Basin Dairy Area (CBDA) is considered to have the highest concentration of dairies in the world.[7] Dairies within the CBDA generate large amounts of manure, urine and other organic materials. These wastes contribute to excess salts and nutrient loading, specifically total dissolved solids (TDS) and nitrate, present in both the groundwater and surface water systems of the Lower Chino Basin. TDS are mineral salts dissolved in the water that concentrate as the water is reused. The deterioration of the water quality in the Chino Basin and the Santa Ana River has been attributed to this increase in TDS (primarily magnesium and calcium) and nitrate.

It has been estimated by the Santa Ana Regional Water Quality Control Board (SARWQCB) that over 13 million tons of manure have been applied to the Chino Basin since the mid 1950's when dairy farmers relocated to the basin. As a result of this 13 million tons of manure spread across the CBDA, 1.4 millions tons of salts have reached, or will reach groundwater. Salts may have an adverse effect upon human health, increase costs of urban infrastructure and facilities, and increase the cost and decrease the effectiveness of reclaiming wastewater.

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[5] Integrated Water Resources Plan; Metropolitan Water District.

[6] Chino Basin Watermaster (8/99)

[7] Dairies and Their Relationship to Water Quality Problems in the Chino Basin; California Regional Water Quality Control Board, Santa Ana Region (7/90).

It is estimated by the SARWQCB that the current application of manure and wash water to land in the Chino Basin is resulting in 34,000 tons of salt that will reach the groundwater each year[8]. Of that 34,000 tons per year, about 30,000 tons per year is from the application of manure and the remaining 4,200 tons per year is from the discharge of wash water. In addition, the Board staff has estimated that approximately an additional 3,800 tons of salt are discharged to groundwater through the percolation of rainfall runoff from corrals and drainage of manure stockpiles.

Regulatory Context

Federal Water Pollution Control Act

The Federal Water Pollution Control Act, or the 'Clean Water Act' (CWA), requires that discharges from both point and non-point sources into navigable waters meet the stringent standards of the National Pollution Discharge Elimination System (NPDES). In 1990, the U.S. Environmental Protection Agency established requirements for storm water permits for specified categories of industries, municipalities, and certain construction activities. The regulations require that discharges of storm water from construction activity of five acres or more must be regulated as an industrial activity and covered by an NPDES permit.

The Clean Water Act (CWA) states that all concentrated animal feeding operations (CAFOs) are point sources and are subject to NPDES permitting requirements. All dairies within the CBDA have been designated as CAFOs and therefore are required to comply with NPDES.

Porter Cologne Water Quality Act

Section 303 of the Federal Clean Water Act and the State's Porter Cologne Water Quality Act (Porter Cologne) establish water quality standards for ground and surface water in the state. Under the Porter-Cologne Act, the State Water Resources Control Board has the ultimate authority over State water rights and water quality policy. However, Porter-Cologne also establishes nine Regional Water Quality Control Boards (Regional Boards) to oversee water quality on a day-to-day basis at the local/regional level.

As required by the Porter Cologne Act and CWA, dairy operators must retain any on-site storm runoff generated within the dairy up to a 25-year, 24-hour storm event. For the CBDA the 24-hour, 25-year storm is a storm with the intensity of 4.5 inches per day. Historically, the SARWQCB has regulated compliance of both Porter Cologne and CWA through the issuance of a general area-wide permit.

[8] General Waste Discharge Requirements for Concentrated Animal Feeding Operations within the Santa Ana Region, Order 99-11, NPDES No. CAG018001; SARWQCB (8/99)

Water Quality Control Plan

The Santa Ana Region RWQCB administers the Water Quality Control Plan for the Santa Ana River Basin. The Plan, originally published in 1983 with subsequent revisions in 1989 and 1995, sets forth the water quality objectives and outlines the projects and programs for the Santa Ana Watershed. The Water Quality Control plan includes a water supply plan, a groundwater management plan, and a waste management plan. The Regional Board achieves the goals of the plan through the issuance of waste discharge permits, either in the form of waste discharge requirements or NPDES permits.

Water quality objectives for surface water within the Chino Basin are determined for a myriad of known substances and conditions, including: (1) organisms (i.e., algae and bacteria); (2) chemicals and their constituents (i.e., sulfate, sulfide, nitrate, fluoride, ammonia, chlorine, chloride, nitrogen, boron, and sodium); (3) metals (i.e., cadmium, copper, lead); (4) temperature; (5) pH; (6) taste and odor; (7) solids (i.e., suspended and settleable); (8) toxic substances; (9) turbidity; (10) oil and grease; (11) chemical oxygen demand; and (12) dissolved solids.

In 1998 the Regional Water Quality Control Board (RWQCB) listed both Chino Creek and Mill Creek within the plan area as impaired waters due to high nutrient, pathogen, salinity/TDS/chlorides and suspended solids concentrations. The RWQCB has also adopted requirements for dairy operators designed to prevent continued surface and groundwater contamination[9].

In August of 1999 the SARWQCB adopted additional manure handling regulations designed to impede manure waste from further degradation of the Santa Ana River. As adopted, these regulations include the following:

- All dairies, heifer ranches, and calf nurseries in the Region are designated Concentrated Animal Feeding Operations (CAFOs)[a]

- All dairies are required to develop Engineered Waste Management Plans acceptable to the Executive Officer in accordance with established guidelines and construct containment structures to contain the 24-hour, 25-year storm. The cease and desist order was modified in February 2000 by the State RWQCB to enact the schedule for the waste management plans.

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[9] RWQCB Santa Ana Region Order No. 99-11, NPDES No. CAG018001; RWQCB Santa Ana Region Cease and Desist Order No. 99-65 as amended by Order No 2000-01.

[a] The CWA defines a Concentrated Animal Feeding Operation (CAFO) as any AFO that has more than 1,000 animal units (i.e. dairy cattle are considered 1.4 animal units). Additionally, the CWA states that smaller facilities can be designated as CAFOs by a permitting authority (Regional Board) after considering certain criteria. These criteria include in part, the location of the AFO relative to surface waters, the slope, rainfall, and other factors that increase the likelihood of frequency of discharges and the impact of the aggregate amount of waste from any small operations in a watershed that exceed that of larger operations. The SARWQCB staff has determined that all dairies, heifer ranches, and calf nurseries in the Region meet one or more of these criteria, and therefore shall be designated a CAFO under the CWA.

- Disposal of manure to land is prohibited except the use of manure on land that is currently being farmed (not pasture). This disposal must be in agriculturally recognized amounts and is contingent upon the installation of a new groundwater desalter in the basin.

- Removal of the approximately 2 million tons of manure stockpiled in the CBDA by December 31, 2001.

- Ship manure out of the basin within 180 days of scraping the corrals.

Additional information on dairy waste management issues and practices within the CBDA and proposed plan area is contained in Dairy Waste Management, Section 5.12 of this EIR.

Other Water Quality Plans and Initiatives

The Chino Basin Watermaster has prepared the *Optimum Basin Management Program (OBMP)* for the Chino Groundwater Basin to ensure future water demands for the Chino Basin and Lower Santa Ana Basin are met.[10] The OBMP will implement comprehensive groundwater monitoring, recharge, salt management, storage, and conjunctive use programs for the Chino Basin by 2001.

The Santa Ana Watershed Project Authority (SAWPA) and Inland Empire Utilities Agency (IEUA) have cooperatively developed a desalting facility ('desalter') to treat contaminated groundwater within the Chino groundwater sub-basin. This 8 million gallon per day (mgd) facility, located at the intersection of Kimball Avenue and Euclid Avenue, extracts and treats approximately 9,200 acre feet of brackish groundwater annually. An additional desalter within the Chino Basin is in the advanced planning stages. Other desalting facilities and the feasibility of construction of a hydraulic barrier well field within the plan area are also being considered in conjunction with the OBMP.

5.3.3 THRESHOLDS OF SIGNIFICANCE

For purposes of this analysis, a project is considered to have a significant impact if it would:

- Substantially increase the rate or amount of surface runoff in a manner that would expose people or structures to onsite or offsite flooding, or result in peak runoff rates from the site that would exceed existing or planned capacities of downstream flood control systems.

- Substantially alter the existing drainage pattern of the site or area, including alteration of the course of a stream or river.

[10] Optimum Basin Management Program; Wildermuth Environmental for Chino Basin Watermaster (8/19/99).

- Violate water quality standards or waste discharge requirements for the receiving drainages.

5.3.4 PROJECT IMPACTS

The following impacts resulting from implementation of the proposed plan were evaluated and determined to be less than significant.

Flooding and Storm Water Management

Implementation of the proposed plan will encourage land use changes that lead to new development and an increase in impermeable surfaces within the project area. Such increases in impermeable surfaces would create additional storm water runoff, which could exacerbate existing flood hazards unless properly managed and controlled. Lower portions of the plan area within the planned open space system are included in the 100-year flood plain. No habitable structures or facilities that are not suitable to periodic flooding are planned within these areas.

The project site is currently subject to frequent flooding during moderate to severe storm events. Flooding will continue until 1) offsite flows into the plan area are controlled with master planned flood control improvements in the City of Ontario SOI/GPA area (i.e. Master Plan of Drainage for 'New Model Colony') and the Eastvale community in Riverside County, and 2) backbone drainage facilities are provided with implementation of the proposed plan for The Preserve.

Existing drainage patterns and flows through the site will be substantially altered with implementation of storm drain plans to support proposed development. Backbone drainage improvements required to reduce onsite flood hazards and support the proposed plan at buildout are identified in Exhibit 5.3-2.

The Storm Drainage Plan divides the plan area into ten drainage basins. Each basin is tributary to a proposed storm drain system identified as Lines A through J. The proposed lines range in size from 10" to 102", as shown in Table 5.3-1. Onsite drainage facilities will be designed to standards and criteria of the City of Chino and San Bernardino County Flood Control District. Pursuant to City requirements, the necessary facilities will be constructed either prior to or in phase with planned development.

TABLE 5.3-1
PROPOSED DRAINAGE BACKBONE FACILITIES

Line	Description	Size	Length (feet)
A	Double Barrel RCB	10' x 10'	6,000
B	RCP	48" – 72"	7,100
C	RCP	42" – 90"	9,850
D	RCP	48" - 96"	6,700
E	RCP	48"	1,450
F	RCP	36" - 78"	8,000
G	RCP	48" - 66"	5,100
H	RCP	30" - 102"	8,400
I	Trapezoidal Earthen Channel	20' W x 8' H	11,200
J	Earthen Channel	20' W x 8' H	6,000
		Total	**86,900**

Source: City of Chino, Master Plan of Drainage Subarea 2, Preliminary Report (2/01)

Additional onsite private systems to address localized collection and distribution of runoff will also be provided, pursuant to specific plan requirements and as part of the development review process. Detailed drainage studies, including hydrology and hydraulic calculations will be required for all proposed developments. In conjunction with Design Review requirements of the Specific Plan, the City of Chino will be required to make specific findings that grading and drainage of specific projects is coordinated and compatible with surrounding properties. Such reviews will assure that runoff from new development is contained and controlled to prevent impacts on surrounding dairies during the phased transition to buildout under the proposed plan.

The Storm Drainage Plan includes trapezoidal earthen channels along Euclid Avenue and south from Chino Airport along an existing drainage channel to outlets within open space areas above Prado Lake. These channels provide opportunities for augmentation to provide water features that enhance filtration and percolation to the groundwater basin, and potential habitat for waterfowl. Storm drain outlets to the major open space system will be designed to reduce velocities and protect drainage channels from erosion and sedimentation during storm events. No significant scouring or erosion and sedimentation impacts to the receiving channels in the open space system are anticipated.

The proposed plan would not result in significant alteration of the principal streams and watercourses through the site. Existing natural channels within the open space system, including Chino Creek and Mill Creek, would remain unaltered.

At buildout of the proposed plan, existing problems associated with flooding of the dairies, lack of containment and related pollution of downstream receiving waters would be alleviated. With implementation of the Storm Drainage Plan and project-level detailed storm water management studies and measures specified in the specific plan, no significant storm water runoff impacts are anticipated from future development.

Prado Flood Control Basin

The proposed plan generally limits urban development to areas above the 566-foot Prado high water inundation line, consistent with the Prado Dam project and acquisition program. An exception to this is an approximate 55-acre area at the northeast corner of Euclid and Pine Avenues designated Regional Commercial in the proposed plan. This 55-acre area within the 566-foot elevation is part of the proposed 86-acre Regional Commercial center at this location. Thirteen (13) of the 55-acres are owned by the U.S. Army Corps of Engineers (USACE), and an additional acre is owned by Orange County Flood Control District (OCFCD). Any future development at this location would require use agreements and permits with the USACE to offset the loss of flood volume. As a result, no significant impact on Prado Dam inundation capacity is anticipated.

Water Quality

The following impacts resulting from implementation of the proposed plan were evaluated to be potentially significant.

Implementation of the proposed plan will result in a transition from dairies to urban development on approximately 2,100 acres of the site generally north of the 566-foot elevation. As a result, impacts to surface waters from polluted storm water runoff from the dairies will likely diminish over time. However, proposed urban uses would have the potential to degrade surface waters through discharges of urban runoff, containing a variety of pollutants including but not limited to oils, greases, solvents, pesticides and urban debris. These contaminants may enter the storm drain system in the form of street runoff, indiscriminate household use or other sources. Without proper management, potentially significant water quality impacts could occur.

With respect to street run-off and the introduction of other impervious surfaces within the specific plan area, it is unclear whether specific plan post-development runoff would be expected to contain more pollutants than under current conditions. Since storm waters will be collected and transported through the proposed storm drain facilities, those contaminants would be concentrated at each of the discharge points to Prado Lake, Chino Creek and Mill Creek. Urban development, such as that envisioned by the proposed specific plan, typically generates a variety of water contaminants, such as airborne particulates, tire-wear residues, petroleum products, oil and grease, fertilizers and pesticides,

litter and animal wastes. All of these contaminants are found in street runoff, representing the major source of pollution found in urban runoff.

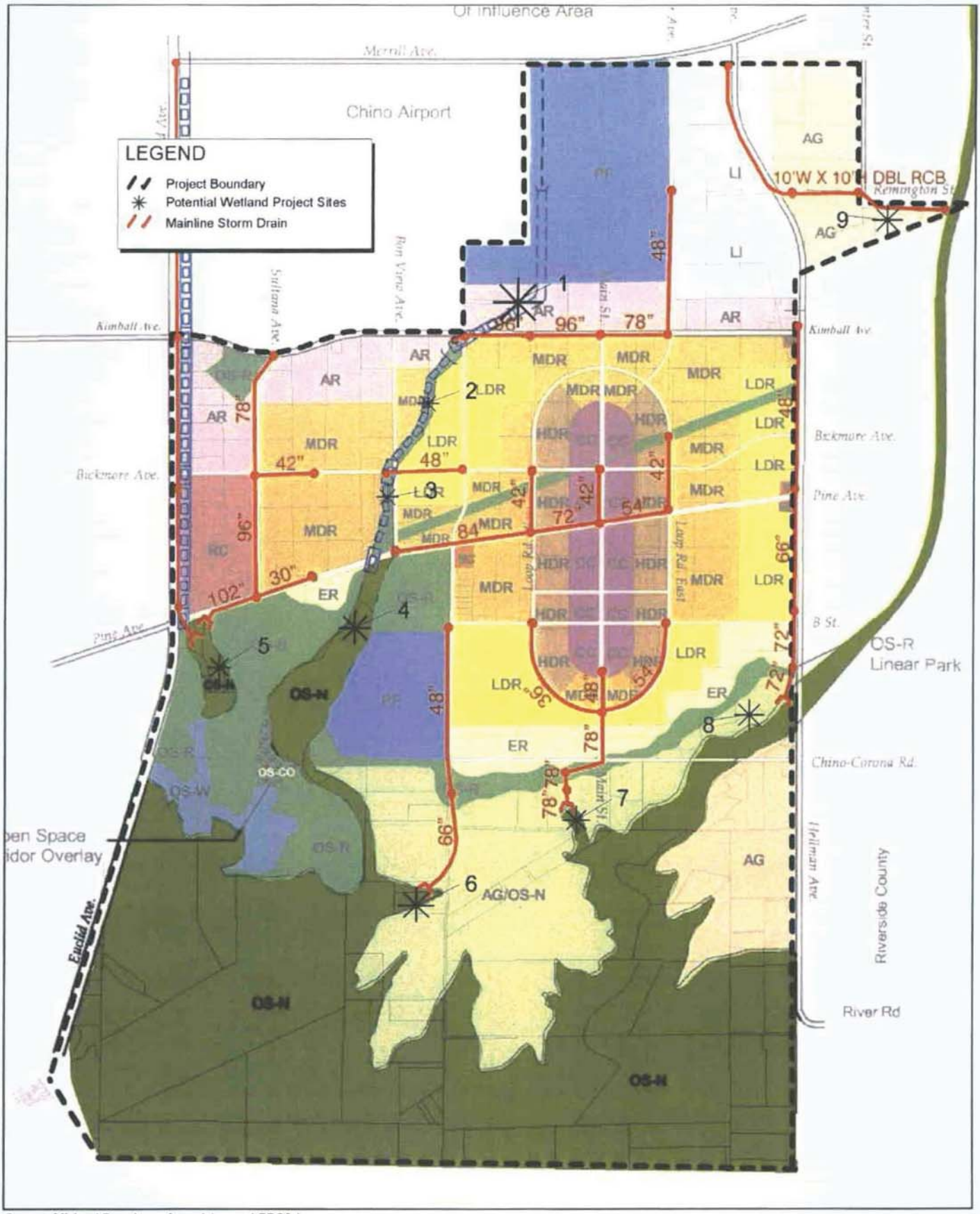
Unless measures to capture and filter the runoff to remove the bulk of contaminants are provided, storm drain discharges at creek outlets could contain contaminant levels that exceed the threshold limits established by the RWQCB. This concentration of contaminants, could jeopardize the beneficial uses identified in the Basin Plan that are dependent upon surface water supplies and the groundwater recharge of the storage units.

Proposed projects occurring upstream of or discharging into impaired waterbodies listed on the Clean Water Act Section 303(d) list may be subject to additional controls (e.g. Total Maximum Daily Loads or TMDLs) pursuant to federal regulations. Both Chino Creek and Mill Creek within the plan area have been listed as impaired waters due to high nutrient, pathogen, salinity/TDS/chlorides and suspended solids concentrations. As tributaries of the Santa Ana River and contributors to groundwater recharge within the Prado Basin, these drainages are of special water quality concern. Without proper management of runoff to protect water quality in Chino and Mill Creeks, potentially significant water quality impacts could occur.

Buildout of the plan area is anticipated to occur over 20 years. Throughout this buildout period, development of the project site will require compliance with the Clean Water Act (CWA), which protects receiving waters by assuring that discharges to "waters of the United States" from any point source to be in compliance with the National Pollutant Discharge Elimination System (NPDES) permit requirements. Section 402 (p) of the CWA establishes the framework for regulating municipal and industrial storm water discharges under the NPDES Program. The regulations provide that discharges of storm waters from construction projects are effectively prohibited, unless the discharge is conducted in compliance with a NPDES permit.

The NPDES program is administered by the State Water Resources Control Board (SWRCB) through the individual California Regional Water Quality Control Boards (RWQCB). General Construction Activity Storm Water NPDES permits are issued for storm water discharges by the RWQCB. Construction activities subject to this General Permit include clearing, grading, disturbances to the ground such as stockpiling, or excavation that results in soil disturbances. Stormwater pollution prevention plans (SWPPP) are required for issuance of a construction NPDES permit; these plans typically include both structural and non-structural Best Management Practices (BMPs) to reduce water quality impacts. Prior to issuance of a grading permit, individual projects will be required to demonstrate compliance with NPDES construction activity stormwater permit requirements.

A number of Best Management Practices (BMPs) are available for application by the City to subsequent development projects within the specific plan area in order to reduce water pollution sources on developed sites to the maximum extent feasible. The incorporation of these BMPs are



Source: Michael Brandman Associates and PBS&J

NORTH

1000 0 1000 2000 Feet

Michael Brandman Associates

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Exhibit **5.3-3**

Potential Wetland Project Sites

THE PRESERVE · CHINO SUBAREA 2

intended to reduce the level of contaminants present at the drainage system discharge points to acceptable levels. Source reduction techniques have proven to be the most cost-effective ways of avoiding or reducing water pollution from urban runoff. Among the source-reduction BMPs that may be applied by the City to individual development projects within the plan area are the following:

Animal Waste Collection. Collection of animal wastes to reduce the levels of bacteria and organic matter released to surface waters.

Exposure Reduction. Partial or total physical enclosure of stockpiled or stored material, loading and unloading areas, and processing operations and the capture of and filtration of drainage from these areas to remove metals, soils and grease, and other chemicals.

Recycling/Waste Disposal. Community hazardous waste and waste oil recycling centers to encourage careful and correct disposal of potentially hazardous chemicals and materials.

Parking Lot and Street Cleaning. Regular parking lot and street cleaning will be conducted and will help reduce accumulation of pollutants deposited on paved surfaces.

Infiltration (Exfiltration) Devices. This includes devices such as infiltration trenches , dry wells, and catch basins that can remove pollutants through adsorption onto soil particles, and biological and chemical conversion in the soil.

Oil and Grease Traps. This includes devices such as oil-water separators, oil and grease trap catch basins, simple skimmers, and control structures to separate oils and grease and other sediments from storm water.

Sand Filters. Sand filters achieve reduction of urban pollutants by passing storm water through beds of sand, allowing particles to settle out in the pre-treatment devices and by straining out particles in the filter.

Filter Strips. This involves placement of close-growing vegetation (e.g., turfgrass) to trap sediments between pollutant source areas and the receiving water.

Grass Swales. Grass-lined drainage swales remove pollutants from surface flow by the filtering action of the grass, sediment deposition, and through infiltration into the soil.

Regular/Routine Maintenance. Regular maintenance and cleaning of all pollution control devices to ensure that those devices are kept clean and unobstructed and are functioning correctly.

The storm drain system and the BMPs applied by the City to individual development projects must conform to non-point stormwater pollution control standards related to the County's Municipal Stormwater Permit, under the NPDES program (Water Quality Order Number 90-136, NPDES CAS000200), as amended by the SWRCB's Statewide General Permit (WQ Order No. 92-08 DWQ) and General Construction Activities Storm Water Permit (WQ Order No. 99-08-DWQ).

5.3.5 CUMULATIVE IMPACTS

Implementation of the proposed plan, along with other projects in the surrounding area Chino Basin Dairy Area (CBDA), will contribute to increases in impervious surfaces (which will increase runoff rates), and incrementally add to the amount of urban pollutants discharged into the drainage system. However, the proposed project's incremental impact would be substantially reduced with application of identified mitigation measures and compliance with state and federal regulations protecting receiving waters. Consequently, the project's contribution to cumulative water resources impacts is considered less than significant.

5.3.6 MITIGATION MEASURES

HWQ-1 All development shall comply with the National Pollutant Discharge Elimination System (NPDES) regulations. Prior to the issuance of a grading permit, applicants shall demonstrate compliance with NPDES Stormwater Permit requirements to the satisfaction of the City of Chino. Applicable BMP provisions shall be incorporated into the NPDES Permit.

HWQ-2 Individual projects within the specific plan area shall be reviewed by the City of Chino for the inclusion of appropriate structural and non-structural Best Management Practices (BMPs) to control stormwater discharges and protect water quality. Structural controls may include, but are not limited to filtration, common area efficient irrigation, common area runoff-minimizing landscape design, velocity dissipation devices, oil/grease separators, inlet trash racks, and catch basin stenciling. Non-structural BMPs can include education for property owners, tenants and occupants, activity restrictions, common area landscape management, litter control, and catch basin inspection, BMP maintenance; and street sweeping.

The following are examples of BMPs that may be included within NPDES permit requirements for individual projects:

- Use of sand bags and temporary desilting basins during project grading and construction during the rainy season (October through April) to prevent discharge of sediment-laden runoff into stormwater facilities.

- Installation of landscaping as soon as paracticable after completion of grading to reduce sediment transport during storms.

- Hydroseeding soil binders or other measures to retain soil on graded building pads if they are not built upon before the onset of the rainy season.

- Incorporation of structural BMPs (e.g., grease traps, debris screens, continuous deflection separators, oil/water separators, drain inlet inserts) into the project design to provide detention and filtering of contaminants in urban runoff from the developed site prior to discharge to stormwater facilities.

- Stenciling of catch basins and other publicly visible flood control facilities with the phrase "No Dumping-Drains to the Ocean."

HWQ-3 The City shall review subsequent development projects within the specific plan area for the application of Best Management Practices (BMPs) to reduce water pollution from urban runoff. Among the source-reduction BMPs that may be required by the City for application to such projects are the following:

- Animal waste reduction
- Exposure reduction
- Recycling/waste disposal
- Parking lot and street cleaning
- Infiltration (exfiltration) devices
- Oil and grease traps
- Sand traps
- Filter strips
- Regular/routine maintenance

The specific measures to be applied shall be determined in conjunction with review of required project hydrology and hydraulic studies, and shall conform to City standards and the standards of the County's Municipal Stormwater Permit, under the NPDES program.

HWQ-4 A water quality monitoring program should be implemented to regularly test the water quality at the project storm drainage outlets to Prado Lake, Chino Creek and Mill Creek. The program should be devised to differentiate the pollutant contributions of project development from dairies during the transitional period. If test results determine that the water quality standards established by the RWQCB are not being met, corrective actions acceptable to the RWQCB would be taken to improve the quality of surface runoff discharged from the outlets to a level in compliance with the adopted RWQCB standards.

HWQ-5 In implementing the Storm Drainage Plan, the City should review subsequent development projects within the plan area for opportunities to provide 'mini-basins' for purposes of detention, filtration and recharge to groundwater. Such basins may have the corollary benefit of providing habitat for waterfowl. Appropriate locations may include storm drain outlets to earthen channels, within or adjacent earthen channels, and at storm drain outlets to the natural open space system.

HWQ-6 The City of Chino shall assure that storm drain facilities and outlets to Prado Regional Park and the natural open space system are designed in a manner that minimizes disruption of park operations and protects park and open space resources. Specific

drainage facility designs at outlets to the major open space system below the 566' elevation shall be made available for review by the County of San Bernardino Flood Control District and U.S. Army Corps of Engineers, as appropriate.

HWQ-7 Prior to any development approvals, a plan for managing urban runoff to protect sensitive drainages within the open space system shall be approved by the City of Chino. This Urban Runoff Management Plan (URMP) will be integrated with the project Storm Drain Plan, and provide the framework and mechanism for:

1) Phased implementation of structural and non-structural best management practices (BMP's) to control stormwater discharges and protect water quality;

2) Review of subsequent projects for inclusion of 'mini-basins' for detention, filtration and recharge to groundwater;

3) The design and location of Natural Treatment Systems (NTS) for water quality purposes within drainages; and

4) Implementation of a water quality monitoring program at storm drain outlets to Prado Lake, Chino Creek and Mill Creek.

The URMP shall be made available for review and comment by the Flood Control Districts of the counties of San Bernardino and Orange, the U.S. Army Corps of Engineers, and Orange County Water District during the City of Chino's review and approval process. The URMP shall assure to the satisfaction of the City of Chino that project development that drains into Chino Creek and Mill Creek will not unacceptably contribute to flooding, scour and erosion, or water quality degradation of these environmentally sensitive drainages.

5.3.7 LEVEL OF SIGNIFICANCE AFTER MITIGATION

With incorporation of project design features, project-level hydrology studies, NPDES permit program requirements, Best Management Practices (BMPs) for point and non-point source pollution control, and other mitigation measures identified above, the flooding, hydrology and water quality impacts of the proposed project would be reduced to a level that is considered less than significant.

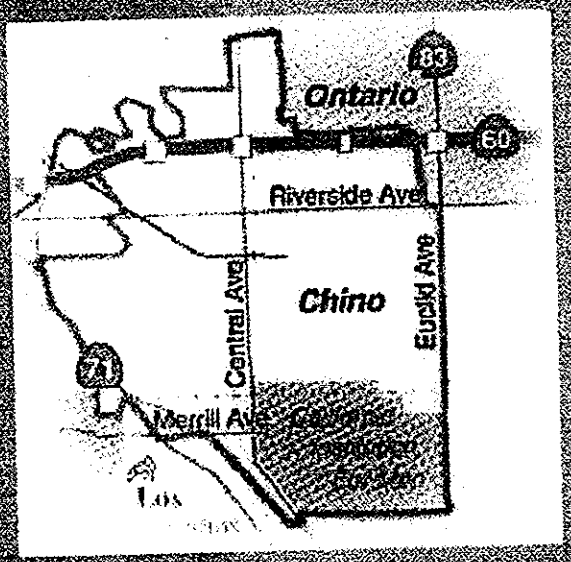
Exhibit I – Master Plan of Drainage Chino Agricultural Preserve Area

Master Plan of Drainage

Subarea 2

Chino Sphere of Influence

Chino Agricultureal Preserve Area



October 2003

Berryman & Henigar

MASTER PLAN OF DRAINAGE

CITY OF CHINO, CALIFORNIA

Prepared for:

CITY OF CHINO

PUBLIC WORKS DEPARTMENT

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Under the supervision of:

Mohammed N.K. Rowther

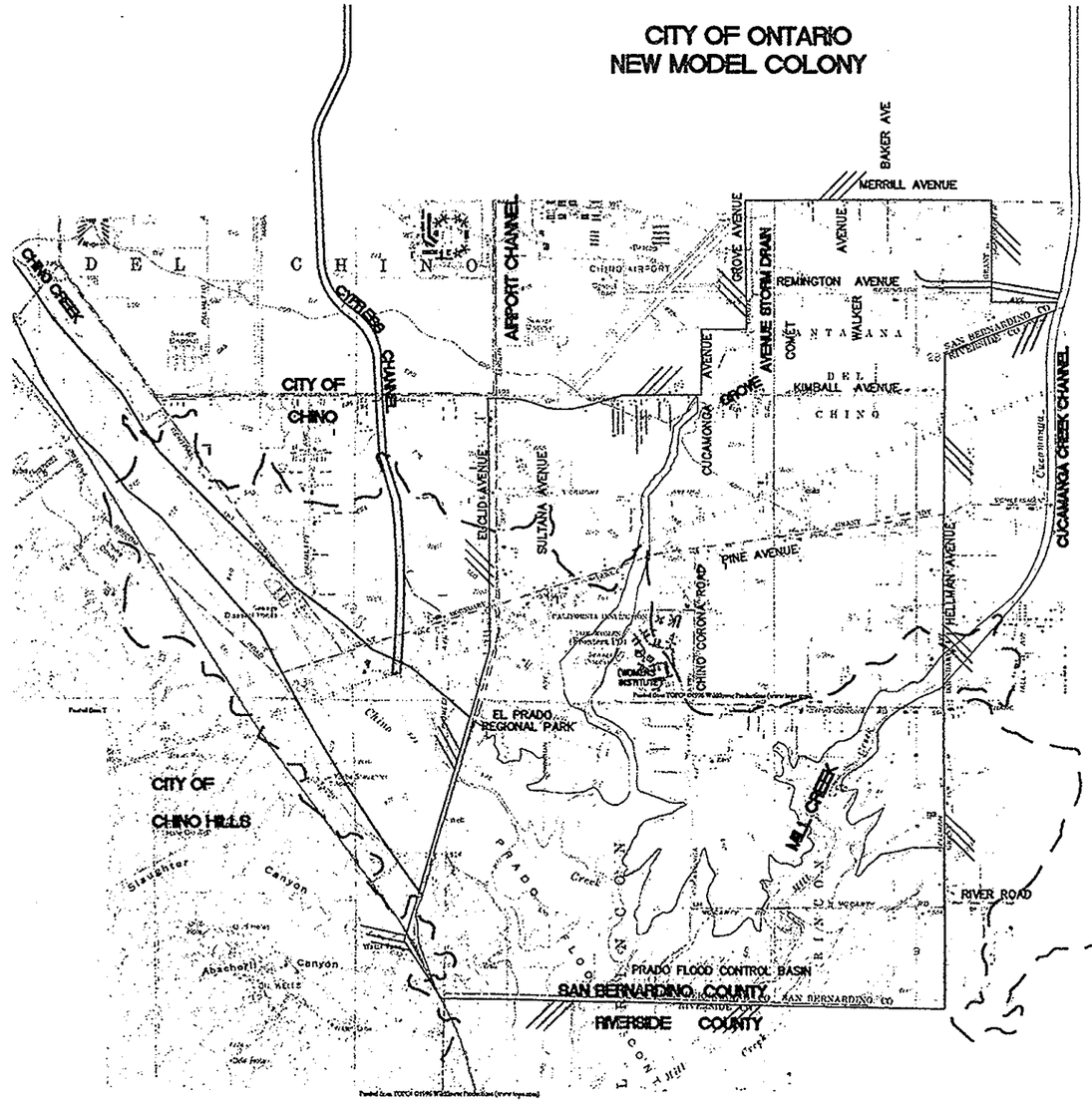
Mohammed N.K. Rowther

10/20/03

Date

TABLE OF CONTENTS

CITY OF ONTARIO
NEW MODEL COLONY



N.T.S.

LEGEND

- 566' CONTOUR
- STUDY AREA

Berryman & Henigar	CHINO AGRICULTURAL PRESERVE AREA CITY OF CHINO SPHERE OF INFLUENCE - SUBAREA 2 MASTER PLAN OF DRAINAGE	CITY OF CHINO STUDY AREA MAP

FIGURE NO. 1

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MASTER PLAN OF DRAINAGE
CITY OF CHINO'S SPHERE OF INFLUENCE – SUBAREA 2
CHINO AGRICULTURAL PRESERVE
FINAL REPORT

INTRODUCTION

As a part of the planning process for the implementation of infrastructure facilities needed for the development of the Chino Agricultural Preserve Area, the City has authorized *Berryman & Henigar* to prepare this Master Plan of Drainage Study and Report of City of Chino's Sphere of Influence – Subarea 2.

This Report presents type, sizes, alignments and cost estimates for recommended backbone drainage facilities required to support full built-out condition of the Study Area.

STUDY AREA

As shown in Figure 1, the Study Area is comprised of the area within the City of Chino's Sphere of Influence (Subarea 2) of the Chino Agricultural Preserve. It is located in the southwest corner of the County of San Bernardino, and is bounded by Euclid Avenue in the City of Chino to the west, County of Riverside to the south and east, and Chino Airport and the City of Ontario's New Model Colony to the north.

The Study Area encompasses approximately 8.5 square miles (5,435.33 acres) of agricultural and open space property adjacent to Cucamonga Creek Channel, and upstream of the U.S. Army Corp of Engineers' Prado Flood Control Basin. The ground surface in this area generally slopes from north to south, with over half (approximately 4.5 square miles) the Study Area lying below the 566' High Water Elevation of the Prado Basin, and therefore within the impoundment area of the Prado Dam.

There is a partially improved storm drain that extends north through the Study Area as an unimproved natural watercourse from the Prado Basin to the outlet of Grove Avenue Storm Drain, located north of Kimball Avenue and west of Grove Avenue. The storm drain then extends north across the Chino Airport Runway as a 10' (wide) x 6' (high) double barrel reinforced box (RCB), thence as a trapezoidal concrete channel across the airport property to Merrill Avenue.

LAND USE

The study is based on ultimate built-out condition of the approved land use plan shown in Figure 2, Land Use Map.

HYDROLOGIC CRITERIA

This master plan study has been prepared in conformance with the hydrological procedures and standards set forth in the San Bernardino County Hydrology Manual, 1986 Revision (Manual).

Based on the size of each tributary drainage area, the Rational Method or the Unit Hydrograph method was used to calculate the peak runoff at each concentration node. The 100 year frequency storm events were used to determine design peak flows for sizing drainage facilities.

Surface characteristics of pervious areas were based on ultimate development (built-out according to land use maps), having good urban covers (well landscaped), and an average antecedent moisture condition (AMC) II.

Point rainfall data was based on the Isohyetal Maps for Valley Areas, provided in the San Bernardino County Hydrology Manual, 1986 Revision (Manual).

HYDRAULIC CRITERIA

The hydraulic criteria outlined in this section are to be used as a guide to be followed for the final design of storm drain facilities in the Study Area. This criteria has been used to the extent applicable in this master plan study.

1. Hydraulic calculations shall be in accordance with "Los Angeles County Flood Control District Design Manual, Hydraulic", dated March 1982.

2. Closed conduits may be designed as flowing full and may be allowed to flow under pressure if the hydraulic grade line is sufficiently below the ground surface to intercept flows with a minimum freeboard at the catch basin of six (6) inches below the gutter flow lines.

3. Where debris may be expected, the design flows shall be increased by an appropriate bulking factor.

4. The velocity in pipe shall not exceed forty (40) feet per second (fps). For velocities from twenty (20) to thirty (30) fps, the minimum concrete cover over the reinforcing steel in the pipe shall be one-half (1/2) inch greater than the normal cover (1 1/2 inches minimum). For velocities from thirty (30) to forty (40) fps, the minimum concrete cover over the reinforcing steel in the pipe shall be one (1) inch greater than the normal cover (2 inches minimum).

5. Minimum spacing between manholes shall be follows:

   a. For conduit thirty (30) inches or smaller, manholes shall be spaced at intervals of approximately three hundred (300) feet. Where the proposed pipe is less than thirty (30) inches in diameter and the horizontal alignment has numerous bends or angle points, the manhole spacing shall be reduced to approximately two hundred (200) feet.

   b. For conduit diameter greater than thirty (30) inches but smaller than forty five (45) inches, manholes shall be spaced at intervals of approximately four hundred (400) feet.

   c. For conduit diameter forty-five (45) inches or larger, manholes shall be spaced at maximum intervals of five hundred (500) feet.

6. Pressure manhole shaft and pressure frame and cover shall be used whenever the water surface in the storm drain can potentially exceed one (1) foot above top of the manhole cover.

7. All manholes and catch basins covers located within the impoundment area of the Prado Basin, below the 566' elevation, shall be securely bolted to the manhole frame.

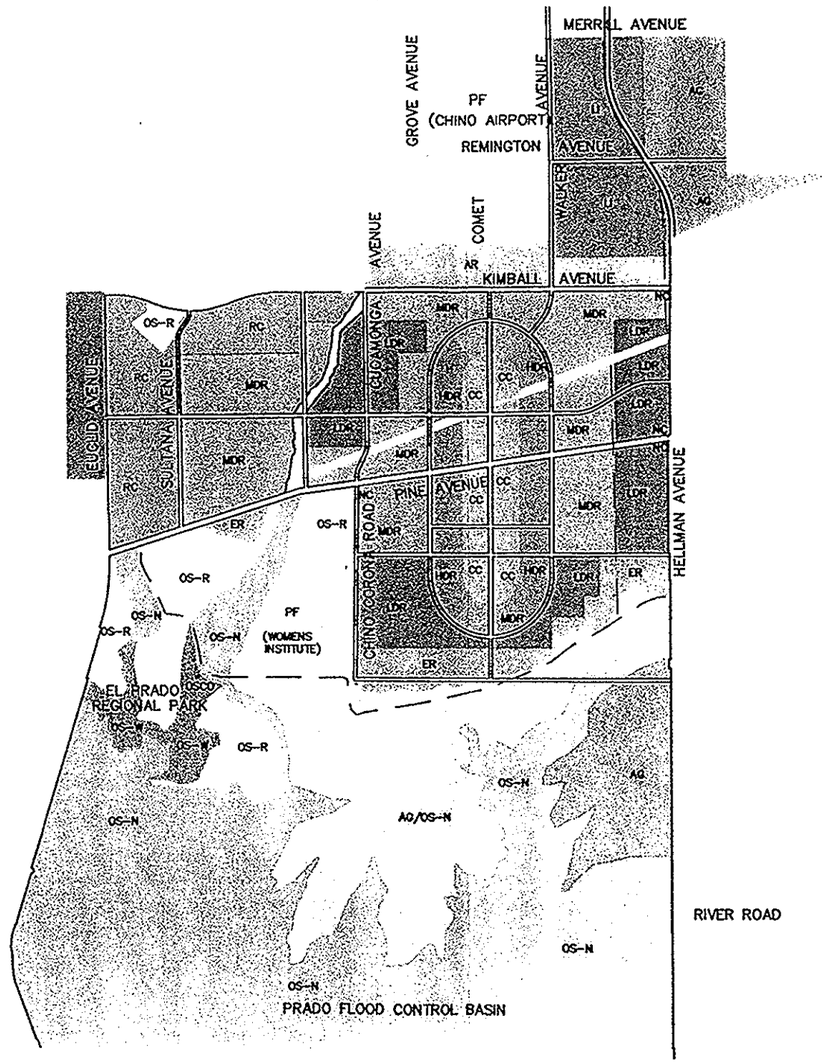
8. The minimum diameter of mainlines and lateral drains shall be 24 inches, and catch basin connector pipe shall be eighteen (18) inches. In cases where the pipe may carry significant amounts of debris, the minimum diameter of mainline pipes shall be thirty-six (36) inches.

9. For storm drains that outlet into earthen channels, outlet structures shall be provided to prevent erosion and property damage. Velocity of flow at the outlet should agree as closely as possible with the existing channel velocity. When the discharge velocity is low or sub-critical, the outlet structures shall consist of a headwall, wing-walls, and apron. When the

discharge velocity is high or supercritical, an appropriate energy dissipater and bank protection structure shall be designed in the vicinity of the outlet.

10. If development occurs in the upstream areas prior to construction of the downstream storm drain facilities, local detention basin should be implemented to handle the additional flows generated from such development. The detention basins shall be designed to retard the discharge from the developing property to 80% of the peak flows calculated for pre-development conditions, and remain operational until full construction of the downstream storm drain facilities.

SCALE: 1'=3000'



LEGEND

- ER – ESTATE RESIDENTIAL
- LDR – LOW DENSITY RESIDENTIAL
- MDR – MEDIUM DENSITY RESIDENTIAL
- HDR – HIGH DENSITY RESIDENTIAL
- NC – NEIGHBORHOOD COMMERCIAL
- RC – REGIONAL COMMERCIAL
- CC – COMMUNITY CORE
- LI – LIGHT INDUSTRIAL
- AR – AIRPORT RELATED
- PF – PUBLIC FACILITY
- OS–R – OPEN SPACE–RECREATION
- OS–N – OPEN SPACE–NATURAL
- OS–W – OPEN SPACE–WATER
- AG – AGRICULTURE
- AG/OS–N AGRICULTURE AND OPEN SPACE–NATURAL
- PROPOSED STREETS

Berryman & Henigar

CHINO AGRICULTURAL PRESERVE AREA
CITY OF CHINO SPHERE OF INFLUENCE–SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

LAND USE MAP

FIGURE NO. 2

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discharge velocity is high or supercritical, an appropriate energy dissipater and bank protection structure shall be designed in the vicinity of the outlet.

OFF-SITE FLOWS

Storm water runoff from the City of Ontario enters the Study Area from the north. Ultimate 100-year storm runoff hydrographs for Ontario's master planned storm drains, per Ontario's Master Plan of Drainage for New Model Colony prepared by L.D. King, Inc., have been incorporated in this study for conveyance to downstream regional drainage facilities. Ontario's master planned storm drains enter the Study Area at three locations as follows:

1. LINE "A": A 14'(wide) x 8'(high) RC Box storm drain is proposed to enter the Study Area at the intersection of Merrill Avenue and Baker Avenue, conveying storm runoff from approximately 1,362 acres with a peak flow of 1,620 cfs.

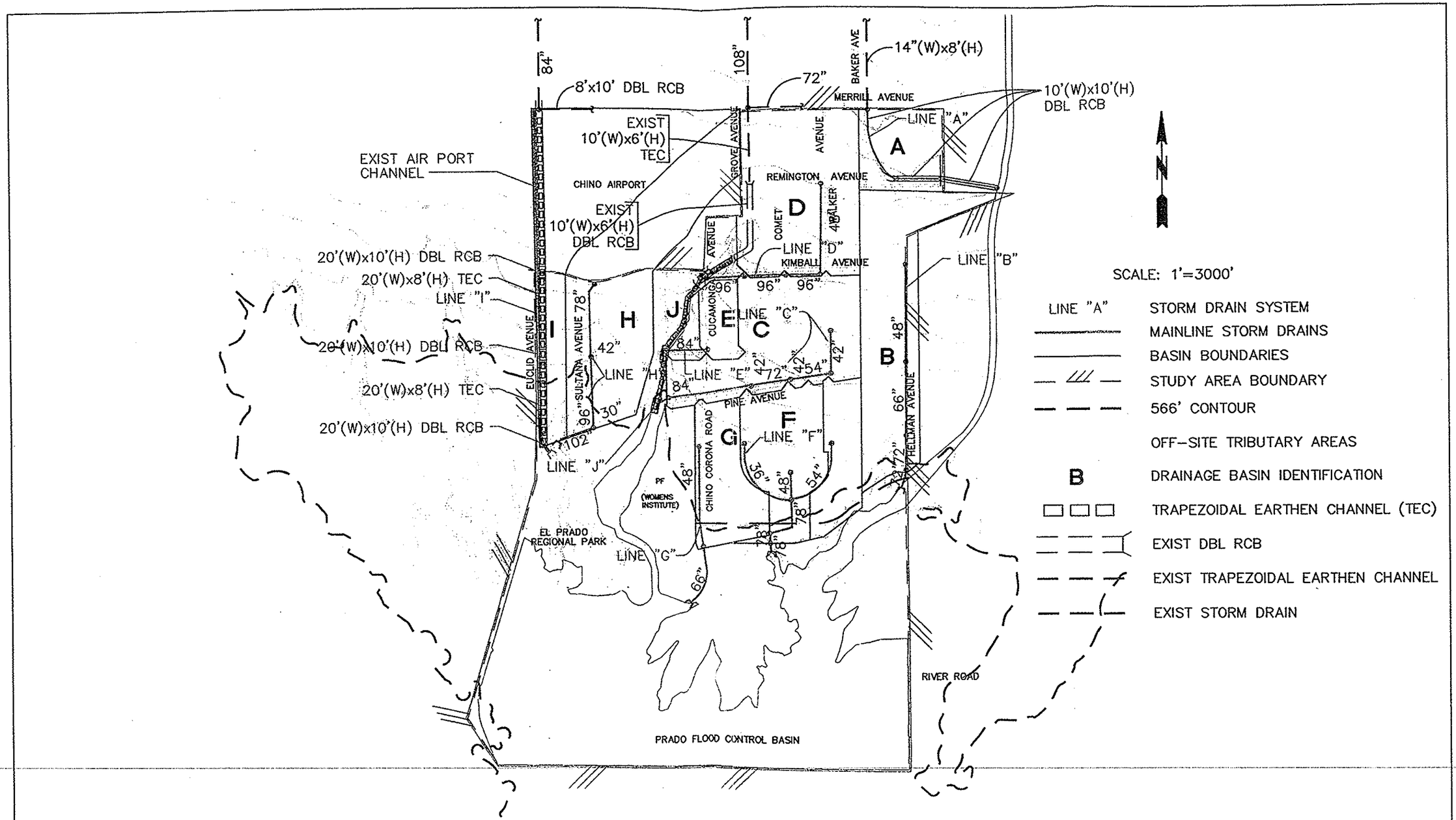
2. LINE "B": A 108" RCP storm drain in Grove Avenue, with a 72" RCP lateral storm drain in Merrill Avenue, is proposed to drain to the existing 10'(wide) x 6'(high) TEC Grove Avenue Storm Drain Channel. This storm drain system will have a peak design flow of 1,214 cfs as it enters the Study Area, with a tributary drainage area of approximately 1,367 acres.

3. LINE "C": A 10'(wide) x 8'(high) RC Box storm drain in Merrill Avenue and an 84" RCP storm drain in Euclid Avenue are proposed to confluence and drain to the existing Airport Channel along Euclid Avenue. This storm drain system will have a peak design flow of 1,443 cfs as it enters the City of Chino, with a tributary drainage area of approximately 1,840 acres. The Airport Channel enters the Study Area at the intersection of Euclid Avenue and Kimball Avenue with a peak flow of 1,846 cfs and a tributary drainage area of 2,277 acres.

DRAINAGE BASINS

Based on the flow pattern of surface runoff, the developable portions of the Study Area have been divided into ten (10) Drainage Basins, as shown in Figure 3, Basin Boundary Map. Each Drainage Basin is tributary to a Recommended Storm Drain System identified as Lines A through J.

The Drainage Basins have been sub-divided into Sub-Basins with concentration nodes to facilitate flow calculations and sizing of the storm drain facilities.



Berryman & Henigar

CHINO AGRICULTURAL PRESERVE AREA
CHINO SPHERE OF INFLUENCE - SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

BASIN BOUNDARY MAP

FIGURE NO. 3

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RECOMMENDED BACKBONE FACILITIES

Facility sizes, along with tributary acreage and peak flow rates at concentration nodes along each storm drain "Line" are presented in Figures 4, 5, 6, and 7, included in Appendix A of this report.

Sizes of recommended storm drains have been based on preliminary hydraulic calculations of friction losses (major losses) in the mainline conduits. The hydraulic gradients of the conduits were set to be at maximum of 85% of design slope, which was assumed to parallel existing average ground elevations at concentration nodes. The 15% available capacity of the hydraulic gradient is to provide for minor losses at junctions, manholes, transitions and bends. Summary of hydraulic data for the proposed facility is presented in Table 1, FACILITY DATA SUMMARY TABLE, included in Appendix B of this report.

LINE "A":

Storm Drain Line "A" is essentially an extension of City of Ontario's master planned Storm Drain " WALK-A1", which runs south in Walker Avenue through New Model Colony to Subarea 2. With Ontario's planned realignment of Walker Avenue and Merrill Avenue, and Chino's planned realignment of Hellman Avenue between Kimball Avenue and Merrill Avenue, Walker Avenue and Hellman Avenue will be aligned across their intersection with Merrill Avenue.

Line "A" is proposed to start at the terminus of Ontario's planned storm drain "WALK-A1" at Merrill Avenue, and run south in the proposed new alignment of Hellman Avenue from Merrill Avenue to Remington Avenue; thence turn east along Remington Avenue to the Cucamonga Creek Channel. This storm drain system will convey storm runoff from approximately 162 acres of Drainage Basin A of Subarea 2, and runoff from approximately 1,480 acres of the City of Ontario.

LINE "A" is comprised of approximately 6,000 feet of 10' x 10' double-barrel RCB with a total Capital Cost estimated at $13.55 million for City of Ontario.

LINE "B":

Storm Drain Line "B" will convey stormwater runoff from approximately 286 acres of Drainage Basin B and approximately 86 acres of off-site area from Riverside County. Drainage Basin B covers the area south of Remington Avenue between Baker Avenue and the San Bernardino/Riverside County Line

Line "B" is comprised of approximately 7,100 linear feet of 48 to 72 inch RCP storm drain in Hellman Avenue that extends from Kimball Avenue to Mill Creek in

the Prado Basin. The total Capital Cost for this storm drain system is estimated at $3.35 million for City of Chino.

LINE "C", LINE "D" and LINE "E":

Storm Drain Lines "C", "D" and "E" are proposed storm drain systems serving portions of the Study Area bounded by Grove Avenue, Merrill Avenue, Baker Avenue and Pine Avenue. These storm drain systems convey stormwater flows in Pine Avenue, Bickmore Avenue and Kimball Avenue westerly to the watercourse downstream of Grove Avenue Storm Drain.

Line "C" is comprised of approximately 9,850 feet of 42 to 90 inch RCP mainline and lateral storm drains with an estimated Project Capital Cost of $4.92 million for City of Chino.

Line "D" is comprised of approximately 6,700 feet of 48 to 96 inch RCP mainline and lateral storm drains with an estimated Project Capital Cost of $3.8 million for City of Chino

Line "E" is approximately 1,450 feet of 48 inch RCP storm drain in Bickmore Avenue with an estimated Project Capital Cost of $0.6 million for City of Chino.

LINE "F" and LINE "G":

Storm Drain Lines "F" and "G" are storm drain systems proposed to service the developable portions of the Study Area that lie to the south of Pine Avenue. These storm drains convey tributary flows southerly to the Prado Basin.

Line "F" is comprised of approximately 8,000 feet of 36 to 78 inch RCP mainline and lateral storm drains with an estimated Project Capital Cost of $3.59 million for City of Chino.

Line "G" is approximately 5,100 feet of 48 to 66 inch RCP storm drain in Chino Corona Road with an estimated Project Capital Cost of $2.22 million for City of Chino.

LINE "H":

Storm Drain Line "H" is an approximately 8,400 feet of 30 to 102 inch diameter storm drain system in Pine Avenue, Bickmore Avenue and Sultana Avenue, with an estimated total Capital Cost of $4.95 million for City of Chino. Starting at Kimball Avenue, the proposed storm drain will run south in Sultana Avenue to drain into the natural watercourse south of Pine Avenue, east of Euclid Avenue.

It is tabled to receive flows from an approximately 287 acres area of Chino Airport and 308 acres from Drainage Basin H.

LINE "I":

The existing storm drain system along Euclid Avenue is comprised of an unimproved, under-capacity earthen ditch along the easterly side of the roadway from Pine Avenue to Kimball Avenue in the Study Area, and an improved trapezoidal earthen channel (Airport Channel) in the street right-of-way from Kimball Avenue to Merrill Avenue in the City of Chino.

Three alternative options were evaluated for this drain.

Option 1: An improved earthen trapezoidal channel, downstream from the Airport Channel, from Kimball Avenue to the natural watercourse south of Pine Avenue, with RCB culvert crossings under Kimball Avenue, Bickmore Avenue and Pine Avenue is recommended option. Assuming that the channel could be constructed within the 200-foot wide existing street right-of-way, the estimated Capital Cost for this Option is $2.55 million. Where estimated Capital Cost share for City of Chino and City of Ontario is $ 0.59 million and $1.96 million respectively.

Option 2: A concrete-lined trapezoidal channel from the outlet to Merrill Avenue, with RCB crossings at Kimball Avenue, Bickmore Avenue and Pine Avenue would have a Capital Cost estimate of $6.0 million.

Option 3: An underground RCB storm drain from the outlet to Merrill Avenue would have a total estimated Capital Cost of $6.9 million.

LINE "J":

Storm Drain Line "J" is comprised of improvements to the natural watercourse downstream from the existing Grove Avenue Storm Drain to south of Pine Avenue. Recommended improvements include the construction of approximately 6,000 linear feet of 20' wide x 8' high earthen trapezoidal channel with RCB culvert crossings at Pine Avenue and Bickmore Avenue, at a total estimated Capital Cost of $2.76 million. Where estimated Capital Cost share for City of Chino and City of Ontario is $ 0.91 million and $1.85 million respectively.

COST ESTIMATES

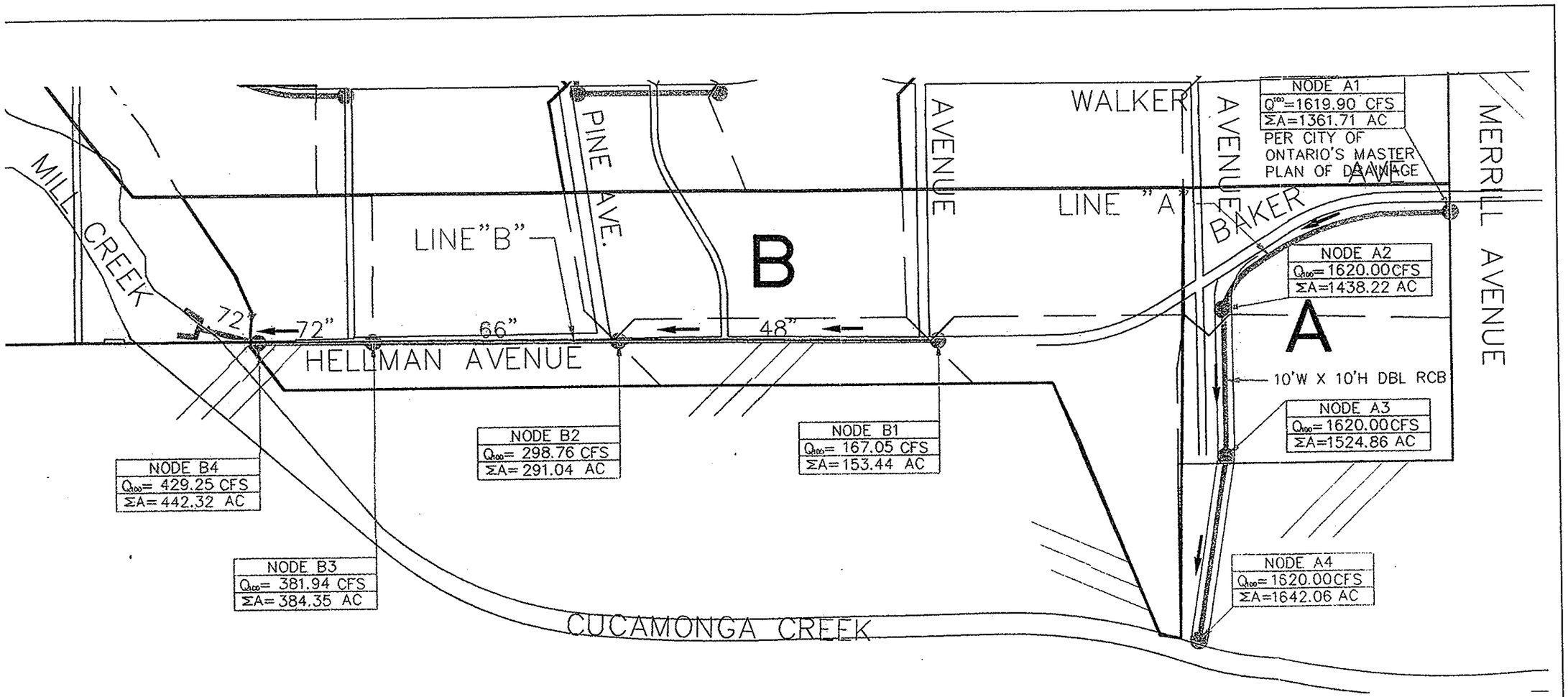
Presented in Appendix C is a detailed breakdown of construction quantities and capital costs for the recommended storm drain systems. Estimates for

construction and project costs have been developed using February 2001 construction costs, based on ENR Construction Cost Index of 6,270, for the recommended storm drain facilities shown on the Basin Hydrology Maps.

The Construction Costs incorporates a contingency of 20% and the Capital Costs includes 10% of Construction Costs for engineering and administration.

APPENDIX A

BASIN HYDROLOGY MAPS



48" MAINLINE STORM DRAINS AND SIZE

BASIN BOUNDARIES

SUB-BASIN BOUNDARIES

566' CONTOUR

STUDY AREA

OFF-SITE TRIBUTARY AREAS

B BASIN IDENTIFICATION

NODE A1
Q100= 111.23 CFS
ΣA= 372.70 AC

CONCENTRATION NODE NO.
DESIGN FLOW
CUMULATIVE WATERSHED AREA

SCALE: 1'=1000'

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CHINO AGRICULTURAL PRESERVE AREA
CITY OF CHINO SPHERE OF INFLUENCE - SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

HYDROLOGY MAP
BASINS A AND B

FIGURE NO. 4

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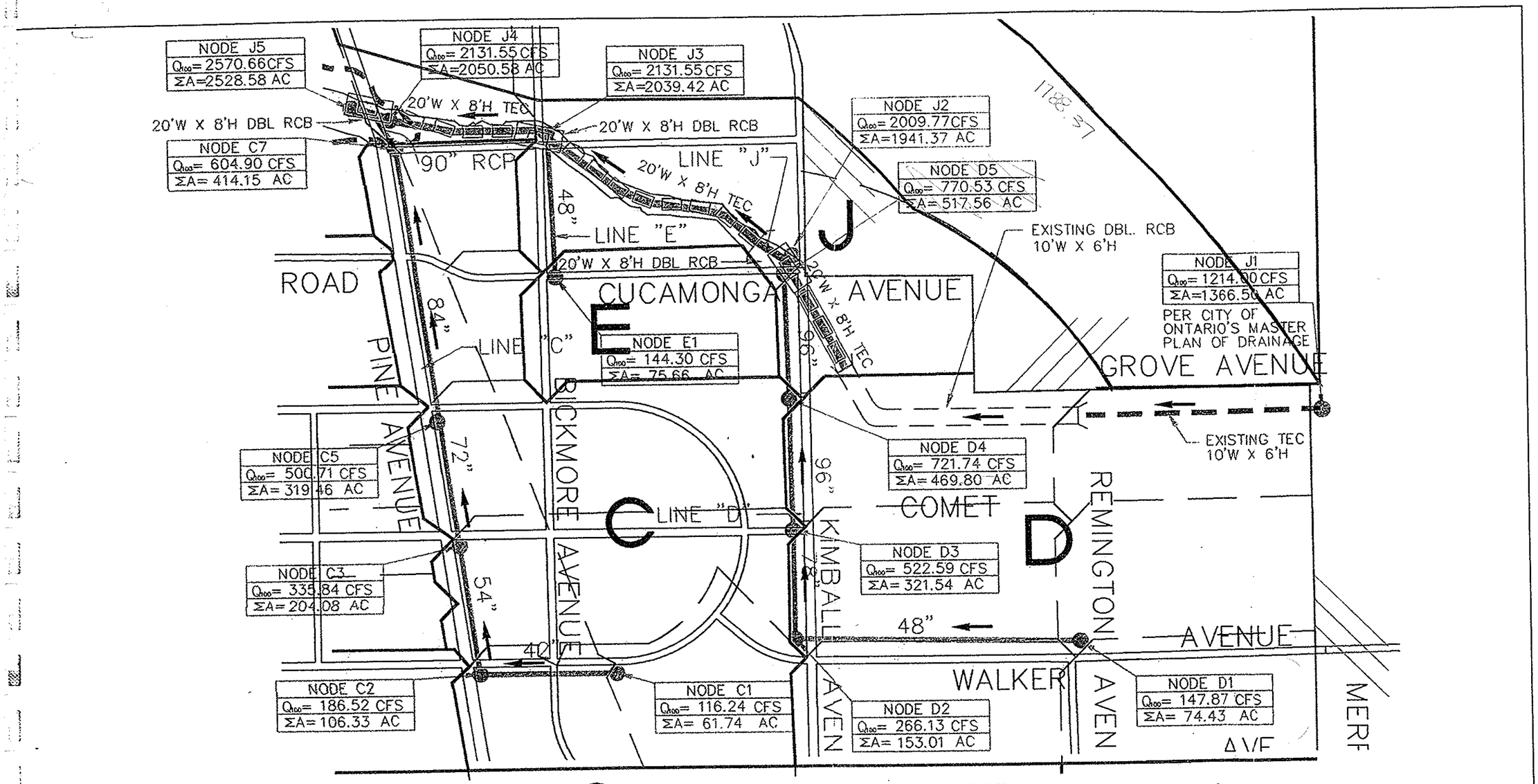

48" MAINLINE STORM DRAINS AND SIZE

BASIN BOUNDARIES

SUB-BASIN BOUNDARIES

366' CONTOUR

STUDY AREA

TRAPEZOIDAL EARTHEN CHANNEL (TEC)

CULVERT CROSSING

C BASIN IDENTIFICATION

SCALE: 1'=1000'

NODE C1
Q100= 231.35 CFS
ΣA= 153.01 AC

CONCENTRATION NODE NO.
DESIGN FLOW
CUMULATIVE WATERSHED AREA

OFF-SITE TRIBUTARY AREAS

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CHINO AGRICULTURAL PRESERVE AREA
CHINO SPHERE OF INFLUENCE - SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

HYDROLOGY MAP
BASINS C,D, E AND J

FIGURE NO. 5

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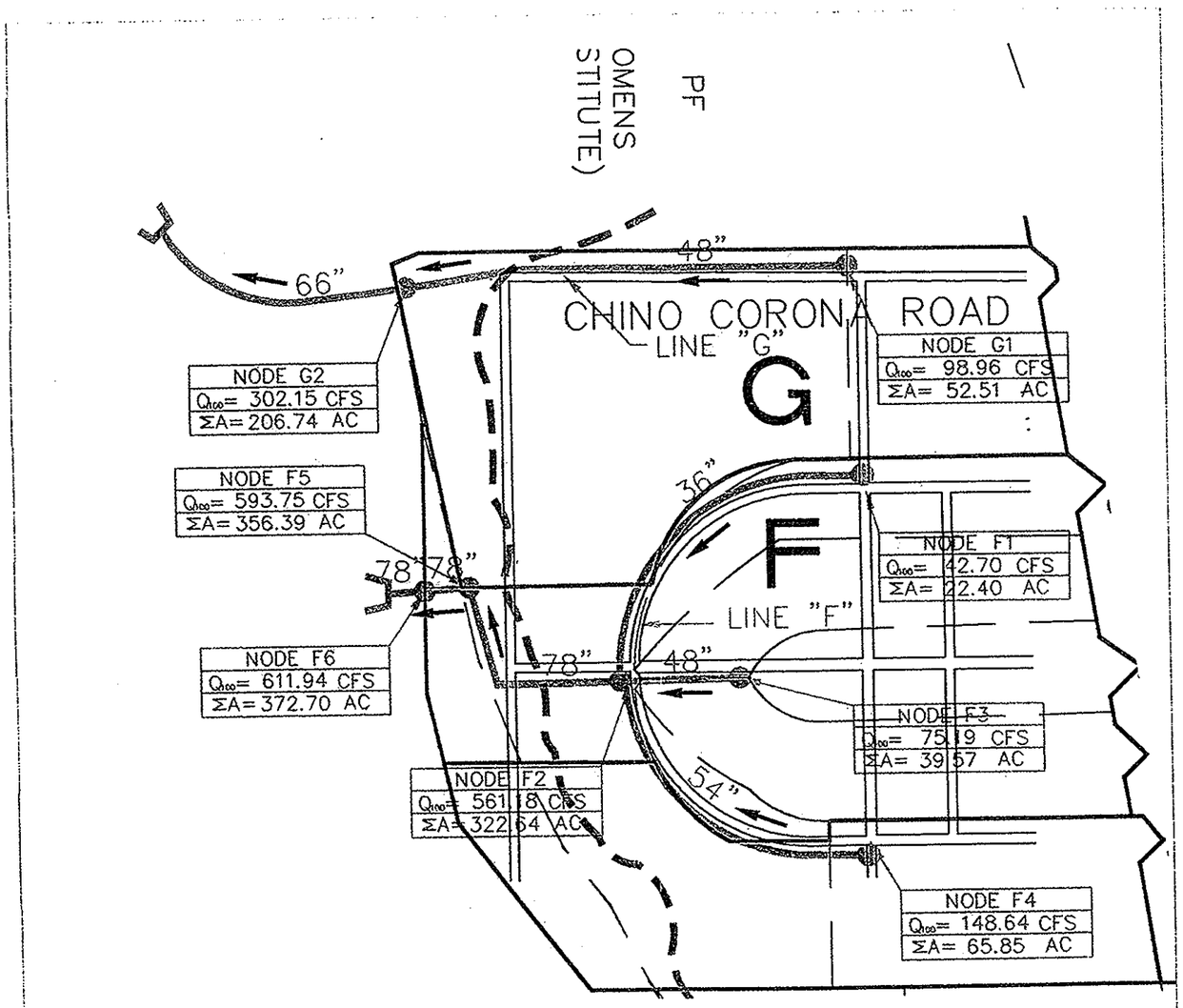

48" MAINLINE STORM DRAINS AND SIZE

BASIN BOUNDARIES

SUB–BASIN BOUNDARIES

566' CONTOUR

F BASIN IDENTIFICATION

SCALE: 1'=1000'

NODE F5	CONCENTRATION NODE NO.
Q_{100}= 368.11 CFS	DESIGN FLOW
ΣA= 356.39 AC	CUMULATIVE WATERSHED AREA

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CHINO AGRICULTURAL PRESERVE AREA
CITY OF CHINO SPHERE OF INFLUENCE - SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

HYDROLOGY MAP
BASIN F AND G

FIGURE NO. 6

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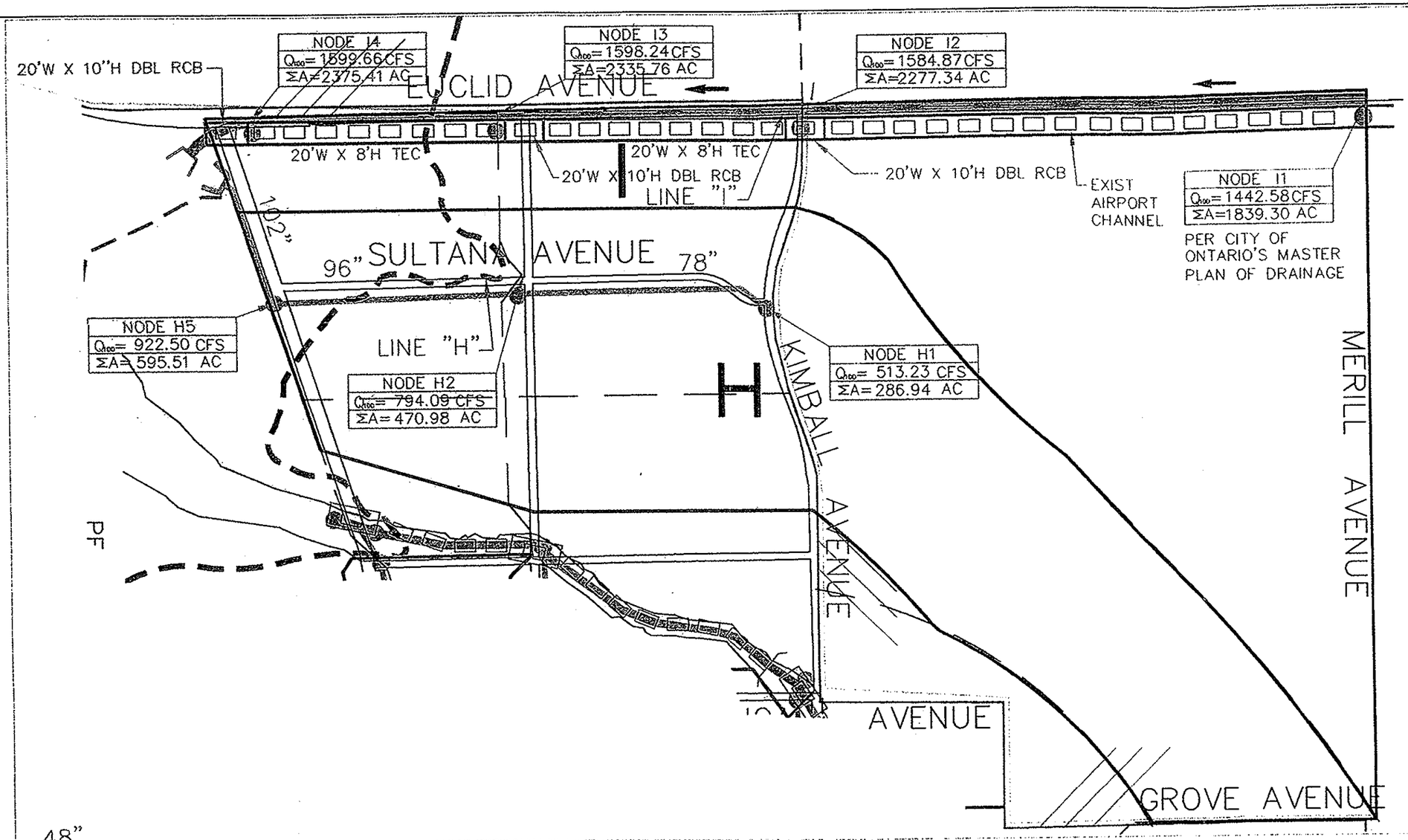

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CHINO AGRICULTURAL PRESERVE AREA
CITY OF CHINO SPHERE OF INFLUENCE - SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

HYDROLOGY MAP
BASIN H AND I

FIGURE NO. 7

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APPENDIX B

FACILITY DATA SUMMARY TABLE

TABLE 1: FACILITY DATA

MASTER PLAN OF DRAINAGE - CHINO SPHERE OF INFLUENCE SUBAREA-2

LINE	NODE		LENGTH	ELEVATION		GROUND	DESIGN	HYDRAULIC	Q10	Q25	Q100	DESIGN	k= Q/Sf^.5	PIPE	BOX SIZE	CHANNEL
	FROM	TO		U/S	D/S	SLOPE	SLOPE	GRADIENT				FLOW		SIZE	DBL. RCB	SIZE
#	#	#	ft	ft	ft	ft/ft	ft/ft	ft/ft	cfs	cfs	cfs	cfs		in	ft X ft	ft X ft
A	Merrill Ave	A1	2800	663	650	0.0046429	0.0021	0.001785			1620	1620	38343.867		10' W X 10' H	
	A1	A2	1400	649	646	0.0021429	0.0021	0.001785			1620	1620	38343.867		10' W X 10' H	
	A2	A3	1800	646	639	0.0038889	0.0021	0.001785			1620	1620	38343.867		10' W X 10' H	
B	B1	B2	3100	628	612	0.0051613	0.01098	0.009333	91	111	159	111	1148.9797	48		
	B2	B3	2400	612	578	0.0141667	0.01098	0.009333	155	192	277	277	2867.2736	66		
	B3	B4	1100	578	570	0.0072727	0.01098	0.009333	193	240	348	348	3602.2065	72		
	B4	OUTLET	500	570	550	0.04	0.01098	0.009333	205	259	382	382	3954.1463	72		
C	C1	C2	1450	610	602	0.0055172	0.0065	0.005525	73	86	110	73	982.10228	42		
	C2	C3	1300	602	595	0.0053846	0.0065	0.005525	116	137	176	137	1843.1235	54		
	C3	C5	1350	595	590	0.0037037	0.0065	0.005525	203	242	314	314	4224.3851	72		
	C5	C7	2700	590	570	0.0074074	0.0065	0.005525	303	361	469	469	6309.6708	84		
	C7	OUTLET	600	570	565	0.0083333	0.0065	0.005525	363	435	567	567	7628.1095	90		
	C4	C3	1200	608	595	0.0108333	0.008	0.006800	58	67	88	58	703.35331	42		
	C6	C5	1250	600	590	0.008	0.008	0.006800	82	96	125	82	994.39606	42		
D	D1	D2	2800	640.5	625	0.0055357	0.005	0.004250	83	97	126	83	1273.1619	48		
	D2	D3	1300	625	620.5	0.0034615	0.003	0.002550	150	177	231	231	4574.4816	78		
	D3	D4	1300	620.5	618	0.0019231	0.003	0.002550	296	349	458	458	9069.7515	96		
	D4	OUTLET	1300	618	610	0.0061538	0.006	0.005100	410	483	636	636	8905.7813	96		
E	E1	E2	1450	580	571	0.0062069	0.0062	0.005270	80	94	124	80	1102.0078	48		

TABLE 1: FACILITY DATA

MASTER PLAN OF DRAINAGE - CHINO SPHERE OF INFLUENCE SUBAREA-2

LINE	NODE		LENGTH	ELEVATION		GROUND	DESIGN	HYDRAULIC	Q10	Q25	Q100	DESIGN	k= Q/Sf^.5	PIPE	BOX SIZE	CHANNEL
	FROM	TO		U/S	D/S	SLOPE	SLOPE	GRADIENT				FLOW		SIZE	DBL. RCB	SIZE
#	#	#	ft	ft	ft	ft/ft	ft/ft	ft/ft	cfs	cfs	cfs	cfs		in	ft X ft	ft X ft
F	F1	F2	2600	577	572	0.0019231	0.002	0.001700	27	32	41	27	654.84619	36		
	F3	F2	900	575	572	0.0033333	0.002	0.001700	44	51	67	44	1067.1568	48		
	F4	F2	2150	582	572	0.0046512	0.002	0.001700	64	76	102	64	1552.228	54		
	F2	F5	1750	572	560	0.0068571	0.006	0.005100	302	357	471	357	4998.9999	78		
	F5	F6	400	560	555	0.0125	0.006	0.005100	310	368	490	368	5153.0307	78		
	F6	OUTLET	200	555	550	0.025	0.006	0.005100	317	377	503	377	5279.0559	78		
G	G1	G2	3300	574.9	565	0.003	0.003	0.002550	58	68	88	58	1148.5711	48		
	G2	OUTLET	1800	565	550	0.0083333	0.003	0.002550	150	184	252	150	2970.4426	66		
H	H1	H2	2500	594	571	0.0092	0.0075	0.006375	307	359	467	359	4496.2904	78		
	H2	H5	2300	571	565	0.0026087	0.0075	0.006375	471	554	721	721	9030.1543	96		
	H5	OUTLET	1200	565	550	0.0125	0.0075	0.006375	541	639	839	839	10508.044	102		
	H3	H2	1200	580	571	0.0075	0.0075	0.006375	70	83	109	70	876.71401	42		
	H4	H5	1200	570	562	0.0066667	0.0066	0.005610	26	32	44	26	347.12982	30		
EARTHEN TRAPEZOIDAL CHANNEL (OPTION 1)																
I	I2	I3	2900	595	574	0.0072414	0.007				1396	1396				20' W X 8' H
	I3	I4	2300	574	559	0.0065217	0.007				1605	1605				20' W X 8' H
	I4	OUTLET	700	559	551	0.0114286	0.007				1621	1621				20' W X 8' H
CONCRETE TRAPEZOIDAL CHANNEL (OPTION 2)																
I	I1	I2	5300	635	595	0.0075472	0.007				1443	1443				20' W X 5' H
	I2	I3	2900	595	574	0.0072414	0.007				1396	1396				20' W X 5' H
I	I3	I4	2300	574	559	0.0065217	0.007				1605	1605				20' W X 5' H
	I4	OUTLET	700	559	551	0.0114286	0.007				1621	1621				20' W X 5' H

TABLE 1: FACILITY DATA

MASTER PLAN OF DRAINAGE - CHINO SPHERE OF INFLUENCE SUBAREA-2

LINE	NODE		LENGTH	ELEVATION		GROUND	DESIGN	HYDRAULIC	Q10	Q25	Q100	DESIGN	k= Q/Sf^.5	PIPE	BOX SIZE	CHANNEL
	FROM	TO		U/S	D/S	SLOPE	SLOPE	GRADIENT				FLOW		SIZE	DBL. RCB	SIZE
#	#	#	ft	ft	ft	ft/ft	ft/ft	ft/ft	cfs	cfs	cfs	cfs		in	ft X ft	ft X ft
REINFORCED CONCRETE BOX (OPTION 3)																
I	I1	I2	5300	635	595	0.0075472	0.007	0.005950			1443	1443	18707.159			20' W X 5' H
	I2	I3	2900	595	574	0.0072414	0.007	0.005950			1396	1396	18097.848			20' W X 5' H
	I3	I4	2300	574	559	0.0065217	0.007	0.005950			1605	1605	20807.34			20' W X 5' H
	I4	OUTLET	700	559	551	0.0114286	0.007	0.005950			1621	1621	21014.765			20' W X 5' H
EARTHEN TRAPEZOIDAL CHANNEL																
J	Exist. RCB	J2	1000	609	602	0.007	0.007				1763	1763				20' W X 8' H
	J2	J3	3200	602	580	0.006875	0.007				1763	1763				20' W X 8' H
	J3	OUTLET	2000	580	566	0.007	0.007				1763	1763				20' W X 8' H

APPENDIX C

CAPITAL COST ESTIMATES

TABLE 1: CAPITAL COST ESTIMATE SUMMARY
MASTER PLAN OF DRAINAGE
CHINO SPHERE OF INFLUENCE- SUBAREA -2

LINE	CITY OF CHINO	CITY OF ONTARIO	TOTAL CAPITAL COST
	CAPITAL COST	CAPITAL COST	
#			
A		$ 13,550,000	$ 13,550,000
B	$ 3,345,320		$ 3,345,320
C	$ 4,921,400		$ 4,921,400
D	$ 3,804,020		$ 3,804,020
E	$ 589,820		$ 589,820
F	$ 3,587,100		$ 3,587,100
G	$ 2,223,100		$ 2,223,100
H	$ 4,953,740		$ 4,953,740
I	$ 587,203	$ 1,965,853	$ 2,553,056
J	$ 910,457	$ 1,848,503	$ 2,758,960
TOTAL COST	$ 24,922,160	$ 17,364,356	$ 42,286,516

CAPITAL COST ESTIMATE

LINE A

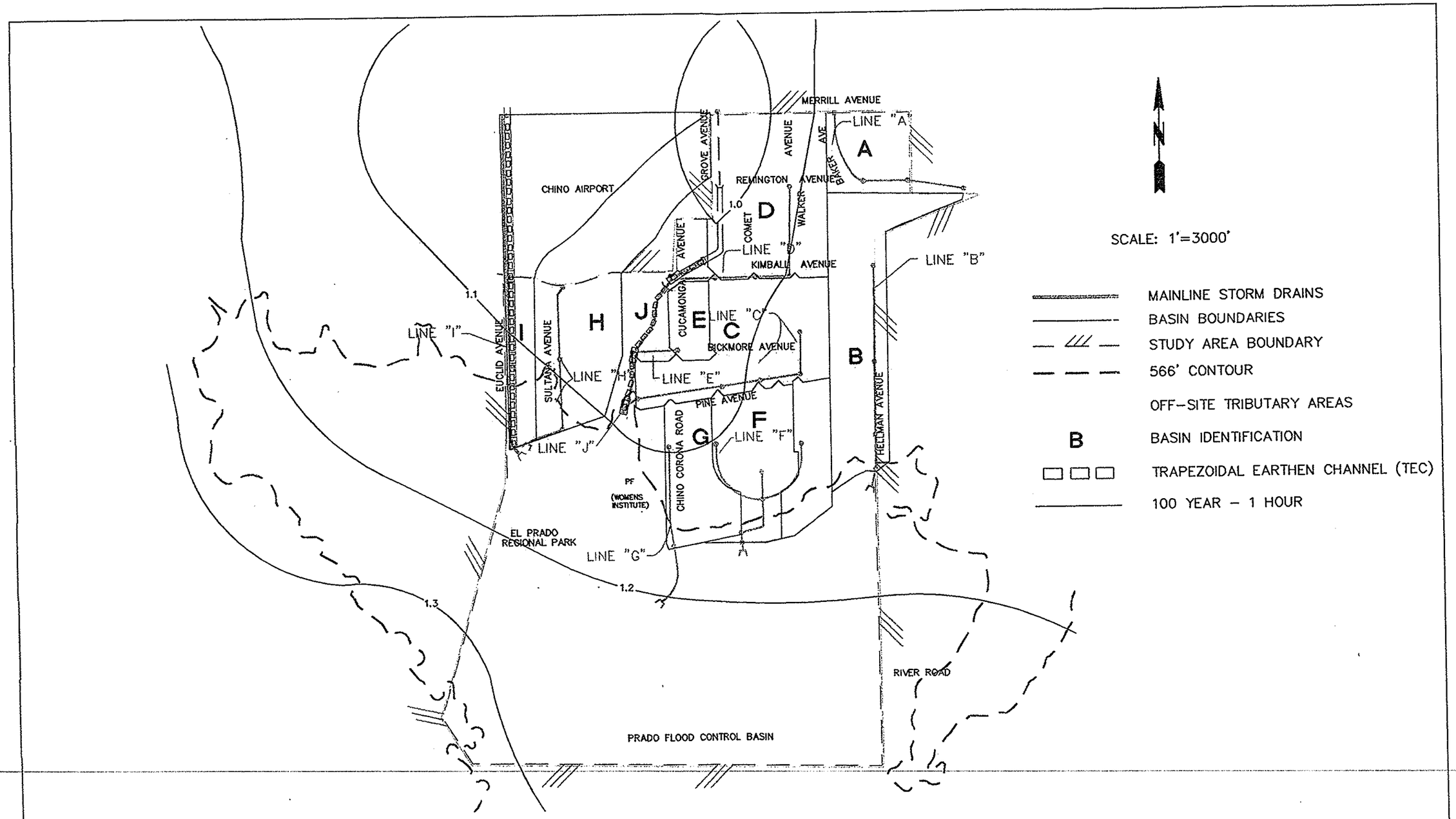
TABLE 2: CAPITAL COST ESTIMATE

MASTER PLAN OF DRAINAGE - CHINO SPHERE OF INFLUENCE - SUBAREA -2

LINE	NODE		SIZE	LENGTH	CONST.	CONST.	ENGR./	TOTAL COST	TOTAL CAPITAL COST	CITY OF CHINO	CITY OF ONTARIO
	FROM	TO			COST	COST	ADMIN.			CAPITAL COST	CAPITAL COST
#				ft	$/LF					0% COST	100% COST
A	MERRILL AVE	CUCAMONGA	10' (W) X 10' (H) DBL. RCB	6000	2,000	$ 12,000,000	$ 1,200,000	$ 13,200,000	$ 13,200,000		$ 13,200,000
		CREEK									
	40' WIDE DRAINAGE EASMENT							$ 350,000	$ 350,000		$ 350,000
TOTAL CAPITAL COST =									$ 13,550,000		$ 13,550,000

APPENDIX D

ISOHYTAL MAPS



Berryman & Henigar

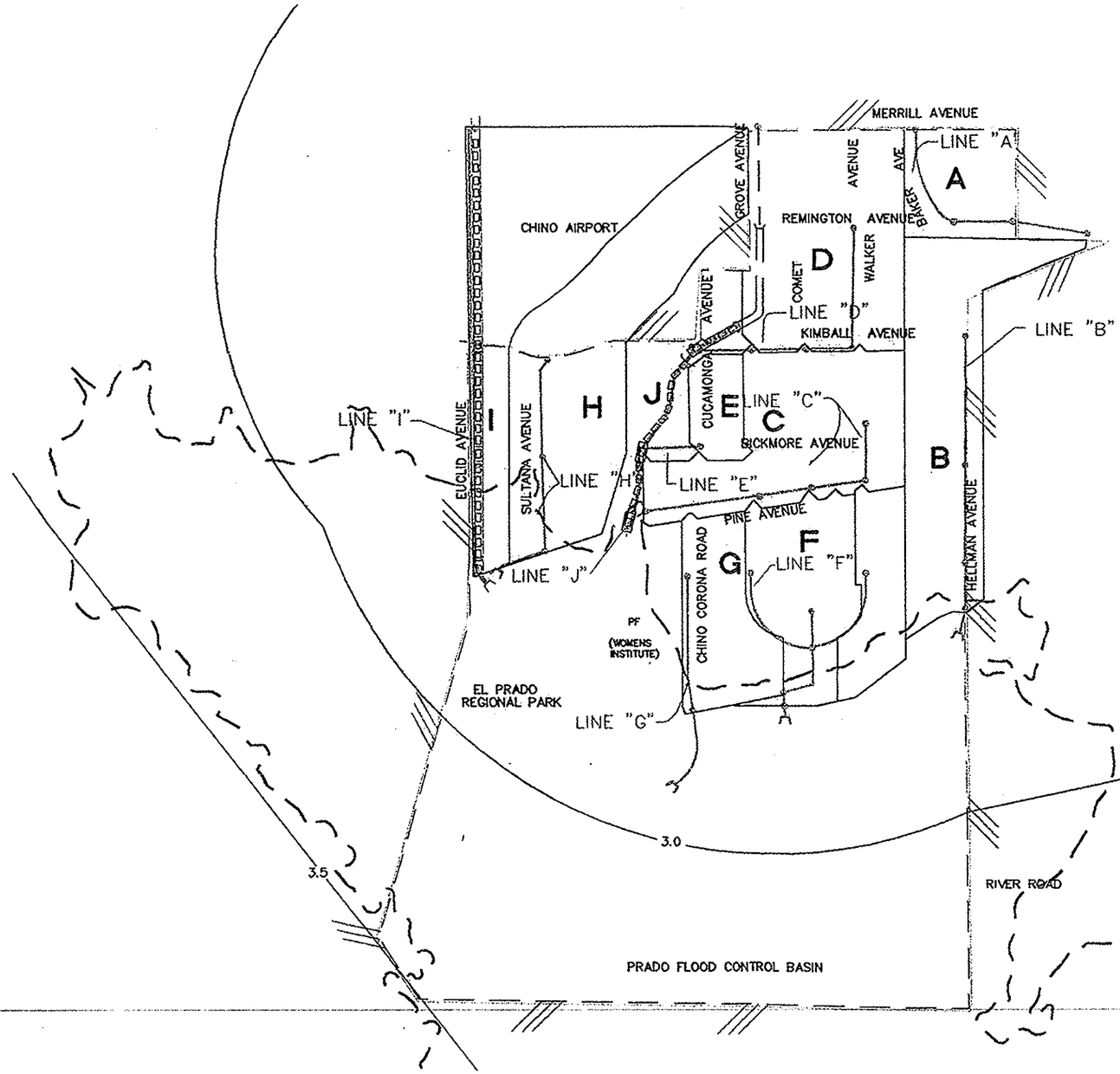
CHINO AGRICULTURAL PRESERVE AREA
CHINO SPHERE OF INFLUENCE - SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

ISOHYETALS
100 YEAR - 1 HOUR

FIGURE NO. 6



SCALE: 1'=3000'

- MAINLINE STORM DRAINS
- BASIN BOUNDARIES
- STUDY AREA BOUNDARY
- 566' CONTOUR
- OFF-SITE TRIBUTARY AREAS
- B — BASIN IDENTIFICATION
- TRAPEZOIDAL EARTHEN CHANNEL (TEC)
- 100 YEAR – 6 HOUR

Berryman & Henigar

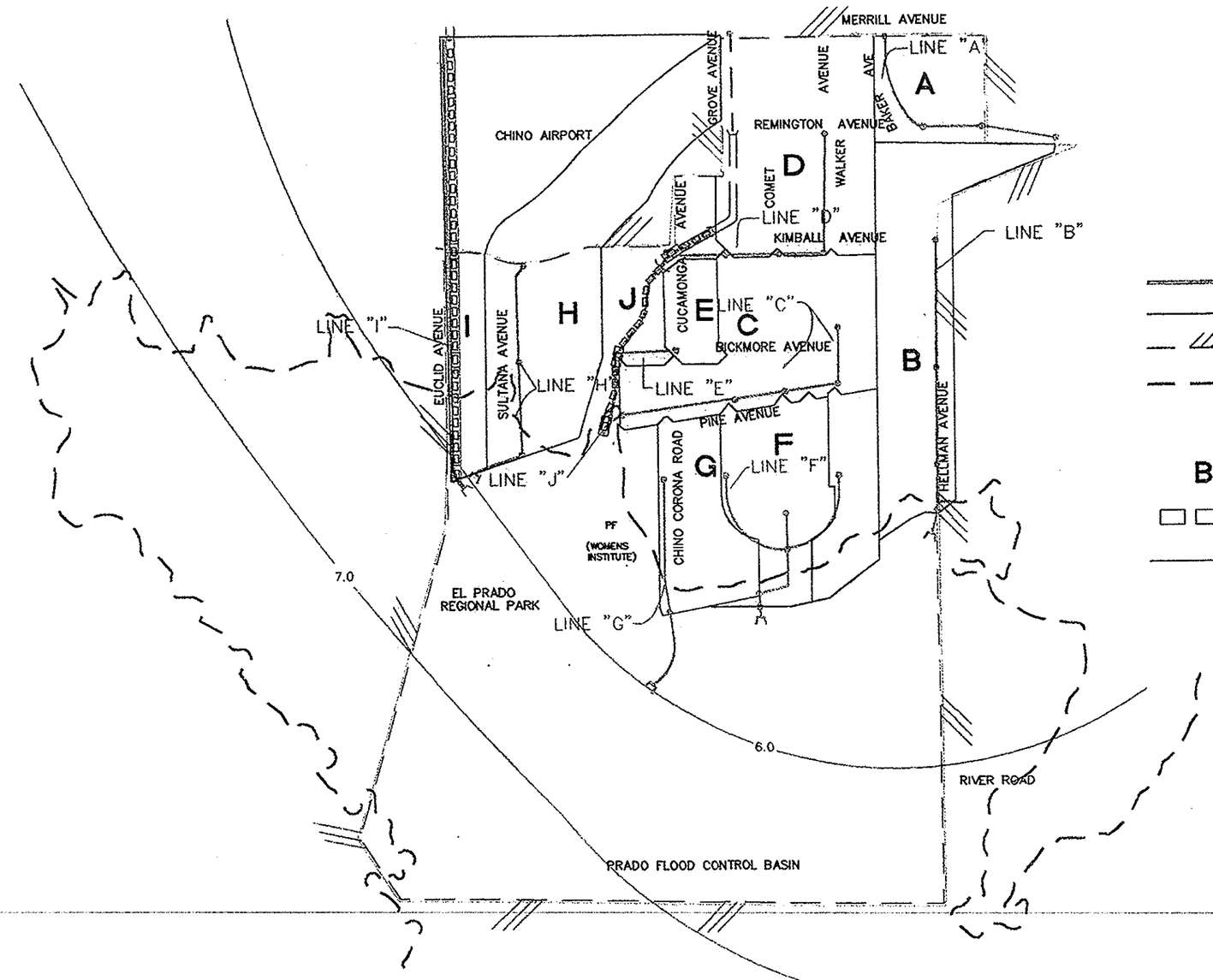
CHINO AGRICULTURAL PRESERVE AREA
CHINO SPHERE OF INFLUENCE - SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

ISOHYETALS
100 YEAR - 6 HOUR

FIGURE NO. 8



SCALE: 1'=3000'

- MAINLINE STORM DRAINS
- BASIN BOUNDARIES
- STUDY AREA BOUNDARY
- 566' CONTOUR
- OFF-SITE TRIBUTARY AREAS
- B — BASIN IDENTIFICATION
- TRAPEZOIDAL EARTHEN CHANNEL (TEC)
- 100 YEAR – 24 HOUR

Berryman & Henigar

CHINO AGRICULTURAL PRESERVE AREA
CHINO SPHERE OF INFLUENCE - SUBAREA 2

MASTER PLAN OF DRAINAGE

CITY OF CHINO

ISOHYETALS
100 YEAR - 24 HOUR

FIGURE NO. 8