Water Quality Benefits

Narrative discussion of the estimates of without-project physical conditions:

Prevention of flood damages in the Fresno area is provided by the combination of urban drainage systems and flood control features on upland streams. The Basin "BO" area was determined to be susceptible to damages from stream flows for 25-year, 50-year, and 100-year storm events. However, the 25-year and 50-year storm event protect from stream flows was accomplished prior to the September 30, 2008 eligibility date. Protection from the 100-year event was achieved thereafter. Revisions to eliminate the FEMA Zone "A" flood zones are underway. With respect to the local urban drainage systems, Drainage Area "Y" and Basin "Y", east of Basin "BO", were determined to be below the District's standards for a collection system and storage respectively. Storm water runoff carries suspended solids, pesticides, nitrogen and other chemicals, and during storm events these flows may flood neighborhood streets, local farmlands, and canal systems. Specifically, within the Project area, storm water currently flows directly to a temporary "ponding" basin immediately adjoining a former sewage treatment plant, a state which increased the Fresno Metropolitan Flood Control District's desire to eliminate the use of the temporary pond as soon as possible and thereby eliminate any further risk of groundwater contamination. While it was determined that groundwater was not at risk from the high concentration of inorganic and organic compounds, surface water resources may still be affected.

Narrative discussion of the estimates of with-project physical conditions:

Water Quality Improvements will remove three direct urban runoff discharges from Fancher Creek, and redirect water away from a temporary basin adjoining the former sewage treatment plant site. This water will be directed to Basin "BO", more than a quarter mile away from the former treatment plant site. The storm water management basin will capture this water and remove the majority of the pollutants.

The Project will capture storm water runoff in Basin "BO", where the water will settle. On average, 80% of Total Suspended Solids (TSS) and 50% - 75% of heavy metals found in storm water will settle out in storm water management basins. Additionally, the Project will redirect storm water runoff from the former sewer treatment site in Drainage Area "BO" and reduce the pollutant load. The sediment collected in the basin will be cleaned periodically to remain compliant with regulatory limits.

Description of methods used to estimate without- and with-project conditions:

The completion of the Project will increase the volume of storm water runoff and dry weather non-storm water runoff treated in storm water management basins. Accordingly, the storm water runoff that used to go untreated into local streams and canals will now be treated and infiltrated into the local aquifer, a significant source of our precious drinking water. Additionally, the drainage functions provided by the Project will remove debris, silt, and other contaminants in order to provide a more comprehensive solution for non-point source pollution.

Operation of these basins removes pollutants from infiltrating groundwater and contributes to the preservation of beneficial uses (agricultural, municipal, and industrial beneficial uses) specified for the

Kings Basin subdivision of the Tulare Lake Basin Water Quality Control Plan. Storm water that might otherwise go untreated will be efficiently conveyed to District facilities for treatment and infiltration.
A wide variety of chemicals from urban runoff can be found at elevated concentrations in sediment and storm water runoff, such as bacteria, metals, pathogens, pesticides, zinc, polycyclic aromatic, and hydrocarbons.

The District is currently monitoring other retention basins in an effort to characterize the water quality of urban runoff and to evaluate the water quality treatment performance of storm water retention and detention basins. Basin "EK" is designed as a storm water retention system designed to improve water quality, much in the same way Basin "BO" will be. In a recent 2006 study, it was proved that Basin EK is effective at retaining the mass load of the majority of frequently detected constituents. Boron and total nitrogen exhibited one season of net generation of load through the basin, and a net retention of load through the basin during all other seasons. Mass loads of all other constituents were retained by the basin over the course of the 2006 study. Therefore, it was quantitatively demonstrated that Basin EK, a comparably situated and purposed basin to Basin "BO," prevents pollutant load from discharging to the river, for the majority of pollutants, for the bulk of storms to be encountered.

Description of potential other benefits:

1. The Project will in the long-term, improve the water quality downstream which will protect the San Joaquin River and Tributary Streams, retention basins used for used for recreation, groundwater recharge, agricultural water supply, or as incidental habitats for wildlife.

2. The Project will eliminate 100-year flood risk for residential and non-residential property owners, and reduce the applicable flood insurance premiums. The quantitative estimate of the benefits was based on the National Flood Insurance Program solicitation for Preferred Risk Policies. Although these rates would not apply to areas with high risk of flooding such as the Project Area, they provide a lower-bound estimate of the benefits. Assuming coverage of $30,000 for residential structures and $12,000 for residential property, the premium would be $160 per home per year. Similarly, assuming coverage of $100,000 for non-residential structures and $150,000 for non-residential property, the resulting premium is $1,777 per building per year. Combining both costs, the estimated flood premium cost totals approximately $81,724 per year. Further, conservatively assuming that eliminating the 100-year flood risk will reduce the premium by 50%, the estimated savings is $40,862 per year shown in column (h) of Table 19. <u>The overall benefit to residents and business owners is approximately $553,878 over the life of the Project.</u>

Description of the distribution of local, regional, and statewide benefits, as applicable:

Benefit	Measure	Value	Beneficiaries
Reduce erosion of regional soil table	Qualitative	++	Local
Improve Groundwater Quality	Qualitative	+++	Local/Regional
Improve Surface Water Quality	Qualitative	+++	Local/Regional
Prevent Runoff from reaching former Sewer Treatment Plant Site	Qualitative	++	Local/Regional
Remove Runoff Discharges	Qualitative	++	Local
Improve Downstream Water Quality	Qualitative	+	Local/Regional/Statewide
Reduce Flood Insurance Premiums	Quantitative	$40,862 per year	Local

+ Likely to have minor impacts
++ Likely to have significant impacts
+++ Likely to have very significant impacts

Local/Regional:

1. The Project will remove three direct urban runoff discharges from Fancher Creek, and redirect water away from a temporary basin adjoining the former sewage treatment plant site. This water will be directed to Basin "BO", more than a quarter mile away from the former treatment plant site. The storm water management basin will capture this water and remove the majority of the pollutants.
2. The Project will result in improved groundwater recharge through increased capacity of Basin "BO", a better imported water delivery system, and the provision of a supply of non-potable storm water for landscape irrigation and other outdoor uses.
3. The Project will release surface water not used for groundwater recharge into the canals, with significantly lower concentrations of heavy metals and total dissolved solids.
4. The Project Area will no longer be in the 100-year flood zone, and insurance premiums for residents and businesses will decrease.

Identification of beneficiaries:

1. Agencies in the region will benefit from the Project through the conveyance of supplies, an increased supply of non-potable water, and a substantial reduction in runoff discharge and water pollutants.
2. Residents will benefit from a substantial reduction in the pollutant and contaminant load found in local and regional drinking water supplies.
3. Downstream users will benefit from increased water quality in creeks and canals that are used for a variety of purposes.
4. Residents and business owners will benefit from lower insurance premiums.

When the benefits will be received:

The benefits of the Project will be received starting in December 2012 and full benefits no later than December 2013, when the Project is constructed and fully operational.

Uncertainty of the benefits:

The Project is expected to recharge approximately 740 acre-feet per year in the local aquifer, a major source of local and regional drinking water. This estimate represents the projected added flows to Basin "BO" that would be required to fill the Basin. However, actual benefits received will vary from year to year, depending on the storm events that occur.

Actual water quality found at the proposed sites may vary from the average, and therefore may affect the estimated benefits of natural water filtration.

Description of any adverse effects:

The Project will have one-time construction impacts. Performance provisions have been included in the specifications for Basin "BO" and will be included in the project contract language to minimize adverse effects.

The District has developed various performance standards that are routinely implemented during the construction and operation of projects, as applicable. Therefore, the standards are considered to be part of the project, rather than mitigation measures. The performance standards that are applicable to the project are as follows:

- As necessary and possible, hours of operation for light-generating construction equipment would be restricted to between the hours of 7:00 AM to 7:00 PM.

- District contractors and dirt removal permittees would be required to provide dust control and cleanup of loose soils both within and outside of construction sites in accordance with San Joaquin Valley Air Pollution Control District Rule VIII for the control of fine particulate matter. Haul roads would be cleaned and swept as necessary during hauling operations.

- The District would require of its contractors or permittees to properly maintain internal combustion engines used during construction activities. The District would properly maintain all District owned and operated internal combustion engine machinery.

- Any maintenance activities that would cause or have the potential to cause fugitive emissions would be required to implement dust control measures in accordance with the District's comprehensive Dust Control Plan.

- If objectionable odors originate at a District facility, District staff would investigate the cause of the odor immediately. When the source of the odor is identified, it would be neutralized or removed and properly disposed of in accordance with local, State and federal requirements.

- Prior to the start of construction, all District contractors and subcontractors for the project would be informed in writing of the potential for discover of important cultural or paleontological resources below the ground surface on the project site and legal consequences for damaging or destroying such resources. If any cultural or paleontological resources were found, the District would stop work within the area in questions and a qualified consultant would be retained by the District to evaluate the find and make recommendations for further action.

- If human remains are found during the project activities, the Fresno County Coroner would be notified immediately. The Coroner has two working days to examine the remains and 24 hours to recommend proper treatment or disposition of the remains, following the Native American Heritage Commission guidelines where appropriate.

- The District would ensure that construction projects are controlled through standard specifications. In addition, all construction activities would also be subject to City and County grading ordinances, which would control erosion. A "Removal of Borrow Material Permit" would be issued by the District and signed by any one desiring to remove soil from a District facility. Applicable provisions of the contract and permit would ensure the contractor and permittee excavate per the approved design and quantities.

- Basin slopes would be graded and maintained to minimize erosion. Should soil erosion occur, the erosion material would be kept on-site, within the excavation area, and used to repair eroded areas.

- Once construction activities are complete, the slopes would be seeded and vegetation established.

- Erosion control measures (planting, seeding and mulching) would be established where channel restoration activities have disturbed soils, which slope toward a channel, before the onset of the next rainy season. If suitable vegetation would not become reasonably established, non-erodible materials would be used.

- The District would repair existing controls (sloping, rocks and gabions) from the toe of slope in the channel to the top of the bank, to stabilize eroded areas.

- Except when flood flows may cause immediate damage, erosion control repairs would be limited to periods when there is no or low steam flow.

- The District would select and implement the most appropriate erosion control BMPs identified in the Construction Site Storm Water Quality Management Guidelines.

- The District would conduct a Phase I Preliminary Site Assessment to determine the presence of any hazardous materials prior to land acquisition.

- The District contractors would be required to notify the District of certain specified conditions relating to hazardous waste, unexpected subsurface or latent conditions, or unknown physical

conditions. The District would promptly investigate any such conditions reported to it and take appropriate action to protect public and contractor health and safety.

- The District would immediately begin the cleanup of spills or hazardous materials releases that may occur during construction. The District would notify all applicable responsible agencies as required by law.

- The District contractors would comply with the provisions of the Construction Safety Orders, Tunnel Safety Orders, confined and enclosed spaces and other dangerous atmospheres, and General Safety Orders adopted by the State Division of Industrial Safety, as set forth in Title 8 of the CCR, and applicable worker safety portions of the District or contractor standard specifications.

- Low-flow areas of basins would be designed to maintain ponded water depths that provide for mosquito fish predation on mosquito populations.

- The District would work cooperatively with the Consolidated and Fresno Mosquito and Vector Control Districts to maintain flood control facilities in a manner that discourages mosquito and midge habitat.

- The District would periodically inspect basin facilities to identify District features in need of repair (e.g., fences and pumping stations) and to ensure compliance with District ordinances prohibiting certain activities (e.g., swimming, fishing and golfing).

- The District would implement the Standard Operating Procedures for Monitoring, Maintenance and Disposal of Stormwater Basin Sediment.
- The District would file a Notice of Intent (NOI) for coverage under the National Pollutant Discharge Elimination System (NPDES) State General Construction Activity Storm Water Permit, as required.

- District contractors would comply with the requirement of the NPDES State General Permit, including implementing a stormwater pollution prevention plan.

- Projects would incorporate applicable BMPs from the District Construction and Post-Construction Stormwater Quality Management Guidelines.

- The maximum depth of any urban stormwater retention basin would provide a minimum 10 feet of vertical separation between the lowest floor of the basin and highest anticipated level of groundwater.

- The District would periodically test and remove soils as generally described in the District Services Plan and specified in the District's Standard Operating Procedures for Monitoring, Maintenance and Disposal of Stormwater Basin Sediment. The District would remove soils from accumulation areas as necessary to maintain less than District Prescribed threshold concentrations of indicator contaminants and to ensure contaminant levels do not exceed hazardous waste levels, as defined in CCR Title 22. The District would adjust the frequency of

testing and cleaning as increased data provide improved knowledge of constituent accumulation concentrations and rates.

- As necessary, construction operations shall be limited to between 7:00 AM and 7:00 PM.

Documentation to support information presented in the project, including studies, reports, and technical data, which will be used to assess the project's ability to produce the benefits claimed.

- City of Fresno 2008 Urban Water Management Plan Update (Attachment 3: Work Plan - Exhibit 16)
- Final Environmental Impact Report (Attachment 3: Work Plan - Exhibit 17)
- Fresno Metropolitan Flood Control Service Plan (Attachment 3: Work Plan - Exhibit 19)
- Resolution of Support (Attachment 3: Work Plan - Exhibit 20)
- California Regional Water Quality Control Board NPDES Permit (Attachment 3: Work Plan - Exhibit 2)
- National Flood Insurance Program – Preferred Risk Policy Brochure: Residential, Non-Residential Property. September, 2010.

Table 19 - Water Quality and Other Expected Benefits
(All benefits should be in 2009 dollars)
Project: Fancher Creek Flood Control Improvements

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit $ Value	(h) Annual $ Value (f) x (g)	(i) Discount Factor	(j) Discounted Benefits (h) x (i)
2009	Flood Insurance Premium Savings	Dollars	$0	$0	$0	N/A	$0	1.000	$0
2010	Flood Insurance Premium Savings	Dollars	$0	$0	$0	N/A	$0	0.943	$0
2011	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.890	$36,367
2012	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.840	$34,309
2013	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.792	$32,367
2014	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.747	$30,534
2015	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.705	$28,806
2016	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.665	$27,176
2017	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.627	$25,637
2018	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.592	$24,186
2019	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.558	$22,817
2020	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.527	$21,526
2021	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.497	$20,307
2022	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.469	$19,158
2023	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.442	$18,073
2024	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.417	$17,050
2025	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.394	$16,085
2026	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.371	$15,175
2027	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.350	$14,316
2028	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.331	$13,505
2029	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.312	$12,741
2030	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.294	$12,020
2031	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.278	$11,339
2032	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.262	$10,698
2033	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.247	$10,092
2034	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.233	$9,521
2035	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.220	$8,982
2036	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.207	$8,473
2037	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.196	$7,994
2038	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.185	$7,541
2039	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.174	$7,114
2040	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.164	$6,712
2041	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.155	$6,332
2042	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.146	$5,973
2043	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.138	$5,635
2044	Flood Insurance Premium Savings	Dollars	$0	$40,862	$40,862	N/A	$40,862	0.130	$5,316
Project Life								…	
							Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries		$553,878

Comments: