Addendum No. 1

to the Robert A. Perdue Water Treatment Plant Master Plan Environmental Impact Report

Addendum No. 1 to the Environmental Impact Report for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Facilities

Sweetwater Reservoir Aeration and Destratification System

State Clearinghouse Number 2004011048

Sweetwater Authority
505 Garrett Avenue
Chula Vista, California 91910

July 19, 2024

1. **PROJECT TITLE:** Addendum No.1 to the Environmental Impact Report for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Facilities – Sweetwater Reservoir Aeration and Destratification System.

2. **LEAD AGENCY:** Sweetwater Authority (Authority)

3. **CONTACT PERSON & PHONE:** Israel Marquez, Land and Environmental Manager, (619) 409-6759

4. **PROJECT LOCATION:** The proposed project site is located on the western portion of the Sweetwater Reservoir, just east of the Sweetwater Dam. The Sweetwater Reservoir is located in San Diego County, approximately 7 miles upstream from the San Diego Bay, and surrounded by the unincorporated communities of Spring Valley to the north and Bonita and Sunnyside to the south and west. The U.S. Fish and Wildlife Service (USFWS) San Diego National Wildlife Refuge (Refuge) is located on the east side of the Reservoir. The closest highways to the Reservoir are State Route (SR-) 125, located 300 feet south of the South Dike (a saddle dam located approximately 4,000 feet southeast of Sweetwater Dam), and SR-54, located approximately 650 feet west of the Sweetwater Dam. Portions of Chula Vista and National City are located downstream from the reservoir.

5. **PROJECT SPONSOR'S NAME AND ADDRESS:** Sweetwater Authority, 505 Garrett Avenue, Chula Vista, California, 91910

6. **GENERAL PLAN DESIGNATION:** The Land Use Map associated with the Sweetwater Community Plan and the Spring Valley Community Plan of the San Diego County General Plan designates the entire area surrounding the Sweetwater Reservoir as Public Agency Lands (County of San Diego 2014).

7. **ZONING:** According to the County of San Diego Zoning and General Plan Map, the entire area surrounding the Sweetwater Reservoir is zoned as Public Agency Land (County of San Diego 2021).

8. **PREVIOUS ENVIRONMENTAL DOCUMENTS:** The Authority previously prepared the Environmental Impact Report (EIR) for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities (State Clearinghouse [SCH] No. 2004011048), which was certified by the Sweetwater Authority Governing Board on July 26, 2006. This EIR analyzed the long-term development plan for water treatment facility modifications, necessary to comply with foreseeable water quality regulations and capacity requirements. The Perdue Master Plan involved the development of new structures and piping with a limited amount of rehabilitation of existing facilities. The Phase I improvements described in the master plan involved the installation of a new membrane filtration system (MFS), new pre- and post-filtration chemical feed control facilities, new water pipelines and drains, and discontinuation of the operation of existing filter modules. The Phase II improvements involved the replacement of an existing 10mg water storage facility ("clearwell"), installation of an improved pre-treatment system, construction of solids handling facilities, a hydro-electric turbine facility for renewable electrical power generation, and installation of ultraviolet disinfection (Authority 2006).

9. **PROJECT DESCRIPTION:** The Authority, as a Lead Agency pursuant to the California Environmental Quality Act (CEQA), is proposing the installation of a new aeration and destratification system in Sweetwater Reservoir to replace an abandoned aeration system and to provide water quality improvements to the lake environment and improve the treatability of water at the Robert A. Perdue Water Treatment Plant (WTP). This proposed new aeration system and all its components is referred herein as the "Proposed Project" or "Project Addition".

Project Site and History

The Authority is a public agency and water purveyor in the South Bay area of San Diego County serving a total of approximately 200,000 customers in National City, Bonita, and the western and central portions Chula Vista. The mission of the Authority is to provide its current and future customers with a safe, and reliable water supply through the use of the best available technology, sound management practices, public participation, and a balanced approach to human and environmental needs.

The Authority obtains its water supply from four sources: treated and untreated water from the San Diego County Water Authority (SDCWA); surface runoff from the Sweetwater River watershed; the National City wellfield; and the Richard A. Reynolds Desalination Facility (Desalination Facility), a brackish groundwater desalination facility (Authority 2015).

The Sweetwater Reservoir, which has a total storage capacity of 28,079 acre-feet of water, is operated in conjunction with Loveland Reservoir located approximately 19 miles upstream on the Sweetwater River to provide water to the Authority's approximately 36 square mile service area that includes National City, Bonita, and the western portion of Chula Vista.

The Authority owns and operates two surface water reservoirs: Sweetwater Reservoir and Loveland Reservoir. Sweetwater Reservoir was constructed in 1888 and has an approximate capacity of 28,079 acre-feet (AF). Loveland Reservoir was constructed in 1945 and has an approximate capacity of 25,387 AF. The Sweetwater River watershed is approximately 230 square miles. Sweetwater Reservoir is approximately 17 miles downstream of Loveland Reservoir (Authority 2015).

The Authority operates the Robert A. Perdue WTP located adjacent to the Sweetwater Reservoir. The original plant was designed as a direct filtration plant that treated local water stored in Sweetwater Reservoir and consisted of four gravity sand filters, a 10 million gallon (MG) treated water storage reservoir, and an operations building. With continued development within the Sweetwater River watershed upstream of plant, bacteriological contamination became a concern at Sweetwater Reservoir. In response to new surface water treatment requirements issued by the U.S. Environmental Protection Agency (USEPA), plans for improvement to the filtration plant were initiated. The improved plant was named after Robert A. Perdue, who had been the Director of Water Quality since the inception of public ownership. The improvements included facilities for pretreatment with ferric chloride ($FeCl_3$) and

potassium permanganate ($KMnO_4$), gaseous chlorine (Cl_2) disinfection, flocculation and sedimentation basins to remove suspended matter, gravity filter basins, a new operator control room, a water quality laboratory, and chemical storage and feed buildings (Authority 2006).

The Authority treats its surface water supplies at the Perdue WTP. Particles are removed from the water through a four-step cleaning process, and the water is disinfected with chlorine and ammonia, chemically bound together to form chloramine. The water is also treated to improve its taste, color and odor. The Perdue WTP can process 30 million gallons of water each day.

In 2003, Montgomery Watson Harza (MWH) prepared the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Facilities (Perdue Master Plan). At the time of its development, the Perdue Master Plan was developed to comply with the most current and the proposed federal and state drinking water regulations for removal of harmful microorganisms and other potential contaminants from water sources prior to delivery. The Perdue Master Plan, and the associated Phase I and Phase II capital improvement projects identified therein, guided the improvement and expansion of facilities at the Perdue WTP to provide an adequate supply and quality of treated water to meet the demands of the Authority's customers. The Perdue Master Plan has been updated three times, with the most recent update being conducted by Carollo Engineers, Inc., dated December 2023. Per the Master Plan, several upgrades have been performed over a period spanning from 2008-2024. Upgrades have included the complete refurbishment and automation of the chemical feed systems, including flow pacing; addition of variable frequency drives to select pumps at the raw water pump station; replacement of the filter underdrains, media replacement and addition of air scour to the dual media filters; reconfiguration of the existing gravity sedimentation basins to a dissolved air flotation system (referred to as the "DAF system"); installation of a hydroelectric turbine, and the addition of a fluoridation system. These improvements also included physical infrastructure upgrades of the plants' electrical and controls systems.

In 2020, the Authority oversaw the preparation of a Feasibility Study to Maximize Reservoir Assets and Expand the Local Water Supply (Feasibility Study), prepared by Gillingham Water Engineering and Planning, Inc. (Gillingham Water, 2020). In this Feasibility Study, Gillingham Water recommended installing a new aeration system in Sweetwater Reservoir to improve water quality in the Reservoir, reduce treatment costs at the Perdue WTP, and expand the yield from the reservoir. The aeration system would provide more consistent/healthy levels of dissolved oxygen and improved water quality throughout the water column. Improvement of water quality in the reservoir would enhance the treatability of water at the treatment plant by reducing the occurrence of taste and odor causing algae blooms, reduce levels of dissolved manganese that can cause discoloration of the treated water, reduce nutrient loading from the sediment into the water column that facilitate algae blooms; and improve the stability of the chloramine residual in the treated water by reducing total organic carbon (TOC) levels.

Figure 1. Regional Vicinity

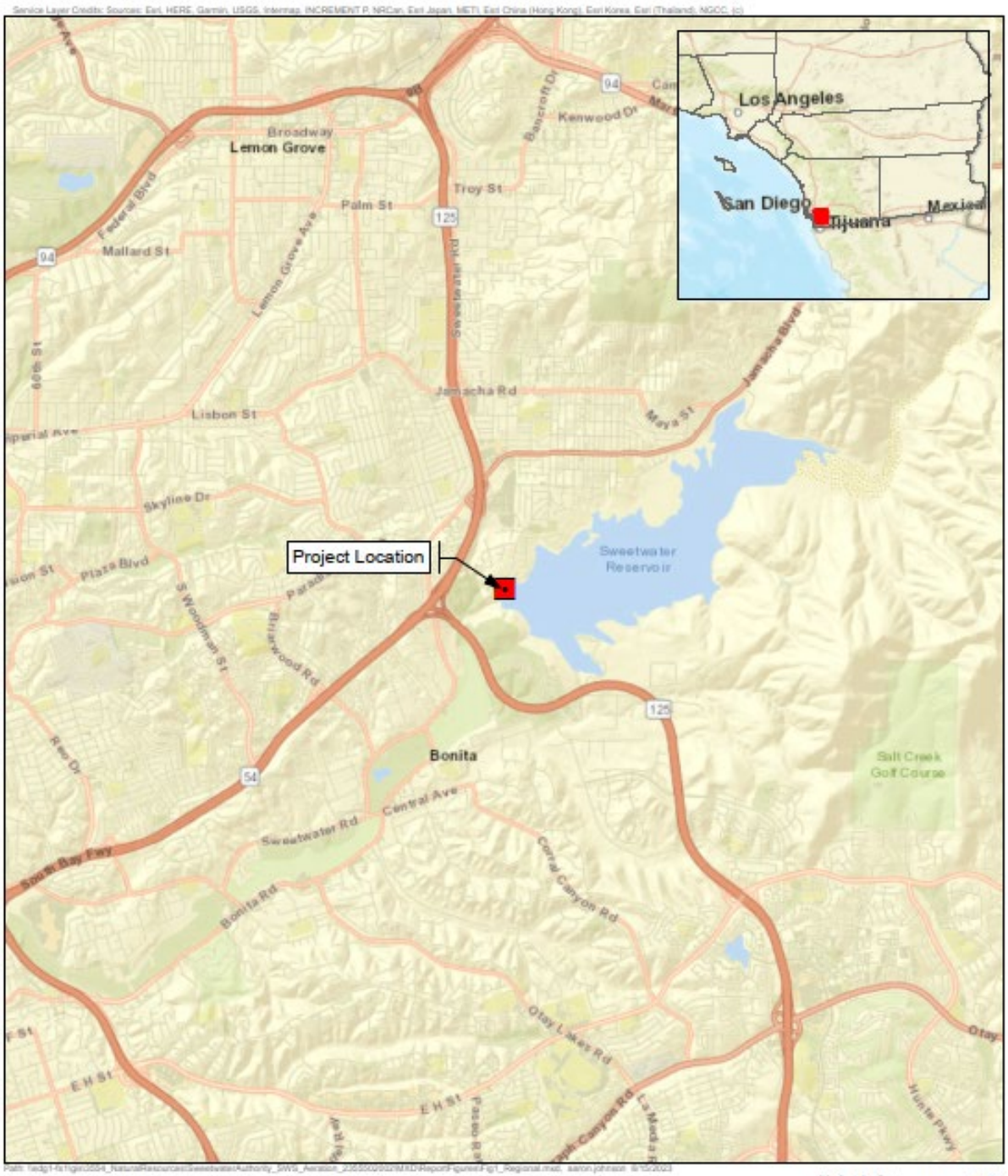


FIGURE 1
Regional Vicinity
Sweetwater Authority
San Diego, CA

Figure 2. Project Vicinity

Although installation of the new aeration and destratification system ("Proposed Addition") is not specifically included in the Perdue Master Plan, the proposed system supports the goal of improving water quality as identified in the plan. Additionally, the proposed construction activities and the installation of equipment necessary to support the Proposed Addition would occur within areas that were previously identified for disturbance in the Perdue Master Plan and the associated EIR.

The proposed new aeration and destratification system would involve the construction, installation, and operation of a 2,500-foot-long air diffuser line, including 4-inch and 10-inch pipes, connected to two 75-horsepower air compressors. Most of the aeration system piping would be underwater, with a small segment visible, from the lake's shoreline, to a valve located near the shoreline of the lake. The underwater portion of the diffuser line would be anchored by concrete structures set at the bottom of the Reservoir and tethered to the line by stainless steel cables. The air compressors would be installed near the existing Perdue WTP at the northwest corner of the Reservoir (refer to Figure 2).

The aeration pipeline would extent into the water just to the right of the existing log boom. The two compressors would be located just behind the retaining wall where the current boat trailer is located.

Construction of the Proposed Addition would occur over a period of 8 months. However, it is estimated that the majority of this time would be for preparatory efforts and materials staging, with active construction taking as little as 4 weeks. The primary materials delivery and construction staging area would occur in a triangular-shaped dirt area to the north of the Perdue WTP, referred to as the "Boneyard." This area currently is used for the storage of heavy construction equipment (e.g., bulldozers) and construction materials used for maintenance activities. The footprint of the proposed compressors, which is where the current boat trailer is located, would be used as a secondary staging area for piping and electrical conduit that would be used to develop the utility connections during the first phase on the project. This phase of construction would involve approximately 500 feet of trenching along the perimeter of the Perdue WTP. Following the completion of the utility work, the paved pad, located adjacent to the north of the Proposed Addition project site, would be used to stage materials for the construction of the air compressors. The construction of the air compressors would begin with the construction of a retaining wall and minor grading to prepare a level concrete pad. The two air compressors would be constructed on top of this foundation and would feed into the diffuser line. As previously described, most of the aeration system piping would be underwater. The shoreside footings for the diffuser line would be permanent and buried in the ground. However, the underwater anchors could be removed if needed. The contractor would install the diffuser line by floating the pipe bundle with the anchors attached. Then, the line would be sunk with the anchors settling on the bottom of the Reservoir. A maximum of ten construction personnel are estimated to be on-site at a given time.

Construction equipment is anticipated to consist of primarily light-duty equipment such as a skid steer loader and telehandler forklift. There is no substantial earthwork that would require soil hauling, and delivery truck trips are estimated to total less than 20.

Required maintenance activities for the Proposed Addition would be minimal and as inspections would occur as needed. During the maintenance activities the pipe bundle would be floated to the surface so that the diffuser line could be cleaned.

10. **SURROUNDING LAND USES:** The Sweetwater Reservoir is bordered by the community of Spring Valley to the north and the community of Bonita to the west and south. Single-family residential homes intermixed with some general commercial and industrial land uses are located north of Reservoir, in the community of Spring Valley. To the southwest of the reservoir, the communities of Bonita and Sunnyside are characterized by more rural, low-density developments. Open space and recreation areas occur immediately southwest of the dam, including Sweetwater Summit Regional Park and the Bonita Golf Course. Further southwest of the SR-125 overpass, the community of Bonita includes primarily residential land uses. The San Diego National Wildlife Refuge (Refuge), which spans 11,152 acres from Jamul to Spring Valley and eastern Chula Vista, is located approximately 500 feet from the southern edge of Sweetwater Reservoir. The Refuge is the USFWS's contribution to the Multiple Species Conservation Program (MSCP), a landscape-wide habitat conservation plan developed to preserve habitat and species while allowing appropriate development (USFWS 2016).

11. **REQUIRED AGENCY APPROVALS:** Sweetwater Authority understands that activities and projects occurring within the highwater mark of the Sweetwater Reservoir may be regulated, depending on the nature of the activity or project. There are three primary agencies that regulate activities within jurisdictional waters in California: U.S. Army Corps of Engineers (USACE) regulates activities pursuant to Section 404 of the Clean Water Act (CWA); California Department of Fish and Wildlife (CDFW) regulates activities under Sections 1602 of the Fish and Game Code; and Regional Water Quality Control Board (RWQCB) regulates activities under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. While the proposed Project would ultimately result in benefits to water quality and the overall lake ecosystem, close coordination with the USACE, RWQCB, and CDFW would be required. Permits may be required under Section 404 of the CWA from the USACE, Section 401 Water Quality Certification from the RWQCB, and Section 1602 of the California Fish and Game Code from the CDFW for the installation and operation of the proposed aeration system.

    In addition, the proposed Project Addition has been designed to fully avoid and minimize impacts to endangered species and sensitive habitats. The Authority understands that these resources are in the vicinity of the project and will coordinate any permitting needs with the wildlife agencies, including CDFW and the U.S. Fish and Wildlife Service. The Authority received a Habitat Loss Permit for the treatment plant expansion in 2006. The Authority will reach out to the wildlife agencies to ensure the proposed Project Additions are consistent with the previous permit and required mitigation obligations.

    Finally, the Authority will coordinate any drinking water permit amendment needs with the State Water Resources Control Board – Division of Drinking Water.

12. NEW SIGNIFICANT ENVIRONMENTAL EFFECTS OR SUBSTANTIALLY MORE SEVERE SIGNIFICANT ENVIRONMENTAL EFFECTS COMPARED TO THOSE IDENTIFIED IN THE PREVIOUS CEQA DOCUMENT: The subject areas checked below were determined to be new significant environmental effects or to be previously identified effects that have a substantial increase in severity either due to a change in project, change in circumstances or new information of substantial importance, as indicated by the checklist and discussion on the following pages:

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Energy
☐ Geology and Soils	☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials
☐ Hydrology and Water Quality	☐ Land Use and Planning	☐ Mineral Resources
☐ Noise	☐ Population and Housing	☐ Public Services
☐ Recreation	☐ Transportation and Traffic	☐ Tribal Cultural Resources
☐ Utilities and Service Systems	☐ Wildfire	☐ Mandatory Findings of Significance

13. DETERMINATION: (To be completed by lead agency):

Based on this initial evaluation:

☐ No substantial changes are proposed in the project and there are no substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous approved ND or MND or certified EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects. Also, there is no “new information of substantial importance” as that term is used in CEQA Guidelines Section 15162(a)(3). Therefore, the previously adopted ND, MND, or previously certified EIR adequately discusses the potential impacts of the project without modification.

☒ No substantial changes are proposed in the project and there are no substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous approved ND or MND or certified EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects. Also, there is no “new information of substantial importance” as that term is used in CEQA Guidelines Section 15162(a)(3). Therefore, the previously adopted ND, MND, or previously certified EIR adequately discusses the

potential impacts of the project; however, minor changes require the preparation of an ADDENDUM.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous ND, MND, or EIR due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). However, all new potentially significant environmental effects or substantial increases in the severity of previously identified significant effects are clearly reduced to below a level of significance through the incorporation of mitigation measures agreed to by the project applicant. Therefore, a SUBSEQUENT MND is required.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous environmental document due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). However, only minor changes or additions or changes would be necessary to make the previous EIR adequate for the project in the changed situation. Therefore, a SUPPLEMENTAL EIR is required.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous environmental document due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). Therefore, a SUBSEQUENT EIR is required.

Erick Del Bosque	8/14/2024
Signature	Date
Erick Del Bosque	Director of Engineering and Operations
Printed Name	Title

potential impacts of the project; however, minor changes require the preparation of an ADDENDUM.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous ND, MND, or EIR due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). However, all new potentially significant environmental effects or substantial increases in the severity of previously identified significant effects are clearly reduced to below a level of significance through the incorporation of mitigation measures agreed to by the project applicant. Therefore, a SUBSEQUENT MND is required.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous environmental document due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). However, only minor changes or additions or changes would be necessary to make the previous EIR adequate for the project in the changed situation. Therefore, a SUPPLEMENTAL EIR is required.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous environmental document due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). Therefore, a SUBSEQUENT EIR is required.

Erick Del Bosque	8/14/2024
Signature	Date
Erick Del Bosque	Director of Engineering and Operations
Printed Name	Title

potential impacts of the project; however, minor changes require the preparation of an ADDENDUM.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous ND, MND, or EIR due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). However, all new potentially significant environmental effects or substantial increases in the severity of previously identified significant effects are clearly reduced to below a level of significance through the incorporation of mitigation measures agreed to by the project applicant. Therefore, a SUBSEQUENT MND is required.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous environmental document due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). However, only minor changes or additions or changes would be necessary to make the previous EIR adequate for the project in the changed situation. Therefore, a SUPPLEMENTAL EIR is required.

☐ Substantial changes are proposed in the project or there are substantial changes in the circumstances under which the project will be undertaken that will require major revisions to the previous environmental document due to the involvement of significant new environmental effects or a substantial increase in the severity of previously identified significant effects. Or, there is “new information of substantial importance,” as that term is used in CEQA Guidelines Section 15162(a)(3). Therefore, a SUBSEQUENT EIR is required.

Erick Del Bosque	8/14/2024
Signature	Date
Erick Del Bosque	Director of Engineering and Operations
Printed Name	Title

14. ENVIRONMENTAL CHECKLIST

1) A finding of “No New Impact/No Impact” means that the potential impact was fully analyzed and/or mitigated in the prior CEQA document and no new or different impacts will result from the proposed activity. A brief explanation is required for all answers except “No New Impact/No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No New Impact/No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No New Impact/No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) A finding of “New Mitigation is Required” means that the project have a new potentially significant impact on the environment or a substantially more severe impact than analyzed in the previously approved or certified CEQA document and that new mitigation is required to address the impact.

3) A finding of “New Potentially Significant Impact” means that the project may have a new potentially significant impact on the environment or a substantially more severe impact than analyzed in the previously approved or certified CEQA document that cannot be mitigated to below a level of significance or be avoided.

4) A finding of “Reduced Impact” means that a previously infeasible mitigation measure is now available, or a previously infeasible alternative is now available that will reduce a significant impact identified in the previously prepared environmental document.

5) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

6) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. CEQA Guidelines Section 15063©(3)(D). In this case, a brief discussion should identify the following:

    a) Earlier Analyses Used. Identify and state where they are available for review.

    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis. Describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the proposed action.

    c) Infeasible Mitigation Measures. Since the previous EIR was certified or previous ND or MND was adopted, discuss any mitigation measures or alternatives previously found not to be feasible that would in fact be feasible or that are considerably different from those previously analyzed and would

substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measures or alternatives.

d) Changes in Circumstances. Since the previous EIR was certified or previous ND or MND was adopted, discuss any changes in the project, changes in circumstances under which the project is undertaken and/or new information of substantial importance" that cause a change in conclusion regarding one or more effects discussed in the original document.

7) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

8) Supporting Information Sources. A source list should be attached, and other sources used, or individuals contacted should be cited in the discussion.

9) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

The explanation of each issue should identify:

a) The significance criteria or threshold, if any, used to evaluate each question;

b) Differences between the proposed activity and the previously approved project described in the approved ND, MND, or certified EIR; and

c) The previously approved mitigation measure identified, if any, to reduce the impact to less than significance.

15. ATTACHMENTS TO ADDENDUM

Attachment No. 1: Environmental Impact Report for the Robert A. Perdue Water Treatment Plan for Future Plant Facilities, dated July 14, 2006.

Attachment No. 2: Aquatic Resource Delineation Report, Sweetwater Reservoir Aeration and Destratification Project, dated July 2024.

16.1 AESTHETICS

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.)	☐	☐	☒	☐
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Would the project:

a) ***Have a substantial adverse effect on a scenic vista?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities determined that improvements at the Perdue WTP – including use of staging and storage areas – would not block or substantially interfere with any scenic viewpoints that do not already contain views of existing elements of the Perdue WTP. The proposed Project, which would be located immediately adjacent to the Perdue WTP, would not block or substantially interfere with any scenic viewpoints within the immediate vicinity of the Project site at the Sweetwater Reservoir. Therefore, there would not be any additional impact from implementation of the proposed Project Addition and the conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?*** While the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities discusses potential impacts to aesthetics and visual resources, the analysis does not specifically identify or address scenic resources within the view provided from state scenic highways. San Miguel Road, located south of the reservoir and approximately 1 mile southeast of the Project site, is a first-priority County of San Diego route for designation as a scenic highway. San Miguel Road provides views of the rolling topography and rural landforms. However, San Miguel Road does not provide views of the Reservoir or the Project site, and the proposed Project would not result in any physical development that would be visible from or otherwise adversely impact scenic views. Therefore, there are no designated state scenic highways, historic buildings (see Section 16.5, Cultural Resources), or landmark trees in the vicinity of the Project site that would be affected proposed Project. The conclusions from the 2006 EIR still apply to the proposed Project as the proposed aeration system would not impact or damage scenic resources.

c) ***In non-urbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings?*** The EIR for the Robert A. Perdue Water Treatment Plant

Master Plan determined that the improvements at the Perdue WTP would not substantially degrade the existing visual character or quality of the site and its surroundings. The proposed Project would involve the construction of a 2,500-foot-long air diffuser line, which would be anchored underwater, and two air compressors. These air compressors would be located in a currently disturbed area designated for operations at the Perdue WTP (currrent boat staging area), behind a retaining wall and/or fence near the existing WTP buildings at the northwest corner of the Reservoir. These air compressors would be similar in character to the existing development at the Perdue WTP, including the extensive water treatment facilitites and associated pavements. Therefore, the proposed Project would not result in a significant change to the existing visual character of the site, and would not result in an additional visual impact. The conclusions from the 2006 EIR still apply to the proposed Project.

d) ***Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*** While the EIR for the Robert A. Perdue Water Treatment Plant Master Plan discusses potential impacts to aesthetics and visual resources, the analysis does not specifically address impacts associated with light and glare. Nevertheless, the Authority proposed to implement mitigation requiring all new exterior lighting to be fulling shield so that the light element is not visible from any adjacent residential or public open space areas. Landside construction associated with the Project Addition would be limited to buried utilities and the two air compressors, which would not create a new source of glare and would not require any nighttime lighting. Therefore, the Project Addition would not result in any impacts, additional or otherwise, associated with substantial light or glare which would adversely affect day or nighttime views in the area.

16.2 AGRICULTURAL RESOURCES

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB).				
Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g])?	☐	☐	☒	☐
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☒	☐

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

In Chapter 6, *Environmental Effects Found Not to be Significant*, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan determined that the improvements at the Perdue WTP are located on previously developed areas with no agricultural resources. The 2006 EIR concluded that the expansion of the Perdue WTP would not convert farmland to nonagricultural use, conflict with existing zoning for agricultural use, or affect farmland that is under a Williamson Act Contract.

The potential impacts associated with the modified project implementation are discussed below.

Would the project:

a) ***Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*** There is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance within the Project Addition site or the surrounding vicinity. Therefore, the proposed Project Addition would result in no impact to such resources.

b) ***Conflict with existing zoning for agricultural use, or a Williamson Act Contract?*** There is no existing zoning for agricultural use or Williamson Act Contracts within the Project site or the surrounding vicinity. Therefore, the proposed Project Addition would result in no impact, additional or otherwise, to such resources.

c) ***Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g])?*** There is no Timberland within the Project site or the surrounding vicinity. Therefore, the proposed Project Addition would result in no impact, additional or otherwise, to such resources.

d) ***Result in the loss of forest land or conversion of forest land to non-forest use?*** There is no forest land within the Project site or the surrounding vicinity. Therefore, the proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use.

e) ***Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?*** There is no farmland or forest land within the Project site or the surrounding vicinity. Therefore, the proposed Project would not result in the conversion of farmland to non-agricultural use or forest land to non-forest use. The proposed Project would result in no impact, additional or otherwise, to such resources.

16.3 AIR QUALITY

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.				
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under the applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☐	☒

Would the project:

a) ***Conflict with or obstruct implementation of the applicable air quality plan?*** The Sweetwater Reservoir – including the Project site – is located in the San Diego Air Basin (Basin). The San Diego Air Pollution Control District (APCD) and San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the Basin.

The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities concluded that the proposed improvements to the Perdue WTP would not result in cumulatively significant regional and local air quality impacts since the construction-related and operational emissions would comply with state and federal ambient air quality standards. Thus, the proposed improvements to the Perdue WTP would be consistent with the San Diego APCD Regional Air Quality Strategies (RAQS), which is a long-range air quality planning document that is based on projected population increases within the Basin. The proposed Project Addition would not result in an increase of pollutant emissions at the site, as all compressors will be electric. Temporary construction activities would be short-term and temporary, lasting for a period of approximately 8 months. It is estimated that the majority of this time would be for preparatory efforts and materials staging, with active construction taking as little as 4 weeks. Additionally, this new aeration system would replace an abandoned and broken aeration system. The air compressors would not be operated continuously, instead they would be used intermittently when existing water quality conditions require it. For example, during the months of July and August it is anticipated that use of the aeration system, including air compressors would not be required. The proposed Project Addition would not result in a significant increase in construction-related or operational emissions, and would not conflict with or obstruction implementation of an air qaulity plan. The conclusions from the 2006 EIR still apply to the Project Addition.

b) ***Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under the applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?*** As previously described, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities concluded that the proposed improvements to the Perdue WTP would not result in cumulatively significant regional and local air quality impacts since construction-related and operational would comply with state and federal ambient air quality standards. The proposed Project Addition may result in an increase in criteria pollutant emissions associated with temporary construction activities as well as operation of the proposed air compressors. However, the Project Addition would not result in a significant increase in construction-related or operational emissions, and would not result in a considerable net increase of any criteria pollutant for which the Basin is in nonattainment and the project would still be in compliance in full compliance. Therefore, the conclusions from the 2006 EIR still apply to the Project Addition.

c) ***Expose sensitive receptors to substantial pollutant concentrations?*** While the EIR for the Robert A. Perdue Water Treatment Plant Master Plan discusses regional and local impacts to air quality, the analysis does not specifically address impacts to individual sensitive receptors. Sensitive receptors in the immediate vicinity of the Project site include the single-family residences located approximately 800 feet to the northeast of the Project Addition site or wildlife in the surrounding area. As previously described, the proposed Project Addition would not result in increases in criteria air pollutant emissions over existing conditions as compressors used for the operation of the aeration system would be electric. Any potential criteria air pollutant emissions would be negligible and would not exceed the emissions for air compressors or other improvements originally estimated in the 2006 EIR. Therefore, the implementation of the proposed Project Addition would not impact any sensitive receptors.

d) ***Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities concluded that the proposed improvements to the Perdue WTP would not result in significant impacts related to odors. In fact, odor control equipment is used in the water treatment plant to reduce odors. Any odors generated at the Perdue WTP as a result of the improvements analyzed in the 2006 EIR would be similar in nature to odors from typical land uses. Odors associated with the proposed Project may be generated from vehicle and heavy construction equipment exhaust fumes during installation of the proposed aeration and destratification system. However, over the long-term operation of the two air compressors would not result in new or substantially increase existing odors. In fact, the proposed aeration and destratification system would be used to reduce algal blooms within the Reservoir, and therefore would reduce odors. The conclusions from the 2006 EIR still apply to the proposed Project Addition in respect to hydrocarbon odor emissions. The Proposed Project has the potential to result in a significant reduction to other undesirable odors, such as those produce by algae blooms. The purpose of the aeration and destratification system is to increase water quality at the lake and reservoir, and operation of the Project Addition would significantly reduce odors in treated water and water at the lake, as the levels of algae blooms would be significantly be reduced. Thus, the Project Addition would result in a reduced impact in regards to odors.

16.4 BIOLOGICAL RESOURCES

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS?	☐	☐	☒	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?	☐	☐	☒	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒	☐

A Biological Resource Technical Report was prepared in support of the EIR for the Robert A. Perdue Water Treatment Plant Master Plan. The 2006 EIR describes that the Sweetwater Reservoir and surrounding lands are considered regionally important resources. More specifically, the coastal sage scrub area surrounding the Perdue WTP facilities provides high overall habitat value, as demonstrated by the dense populations of California gnatcatchers (*Polioptila californica californica*). The 2006 EIR identified the permanent loss of 1.19 acres of coastal sage scrub habitat that would result from the proposed facilities and adjacent access road widening and 0.06 acres that would result from the installation of a proposed 24-inch gravity pipeline between the proposed washwater tank and the MFS facilities. Additionally, construction of new drain lines to Urban Runoff Diversion System (URDS) and an existing outfall south of the clearwell would temporarily impact 0.05 acre of coastal sage scrub. Other impacts to biological resources were also identified, as described in Section 2.6 of the 2006 EIR (Attachment 1) and the Biological Resources Report prepared for the Master Plan.

As part of the 2006 EIR, the following mitigation measures were developed, to mitigate impacts to biological resources (summarized):

1. Consultation with USFWS to determine if Quino checkerspot butterfly surveys were necessary,

2. Coordination with Biologist for development of grading and construction materials, and biological resources training before construction,

3. Temporary exclusionary fencing to protect habitat and avoid accidental intrusions into adjoining sensitive habitats,

4. Compensatory mitigation for coastal sage habitat loss,

5. Permanent preservation of replacement habitat to be assured to the satisfaction of the USFWS and CDFW,

6. In occupied coastal sage scrub, brushing activities shall be conducted between September 1 and February 15 to avoid the California gnatcatcher nesting season. For vireo areas, removal of vegetation removal to occur between October 1 and March 15,

7. Revegetation of any and all temporary impacts with appropriate native species, under supervision of qualified biologist,

8. Permitting with the USACE for any placement of riprap or other materials below the high-water level of the reservoir, and compliance with all permitting requirements,

9. Construction shall be scheduled, to the maximum extent practicable, outside of nesting season, to reduce temporary construction noise impacts to nesting birds,

10. Construction noise exceeding 60 dBA shall be minimized or avoided during the nesting seasons for California gnatcatcher and vireo,

11. When construction during nesting season is unavoidable, an adaptive monitoring program shall be implemented with monitoring performed by qualified biologist,

12. Applicable biological mitigation measures for construction blasting, to reduce excessive noise, vibrations, scattering of blast debris

13. Assessing ambient noise generated from facilities, adjacent to California gnatcatcher and vireo habitat. For any noise exceedance (above 60 dBA), a zone of permanent indirect impact shall be calculated and an acceptable mitigation ratio shall be negotiated with wildlife agencies.

14. Nighttime lighting shall be shielded and directed away from habitat areas,

15. Erosion and sediment BMPs to protect habitat from runoff and sedimentation.

The Authority consulted with U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) regarding these impacts to sensitive habitats and species and obtained a Habitat Loss Permit in August 9, 2006 (FWS-SDG-4966.1) which described the impacts to sensitive biological resources and multiple conditions, including compensatory mitigation for 1.255 acres of coastal sage scrub in the form of credits at the Skelton Ranch Mitigation Area.

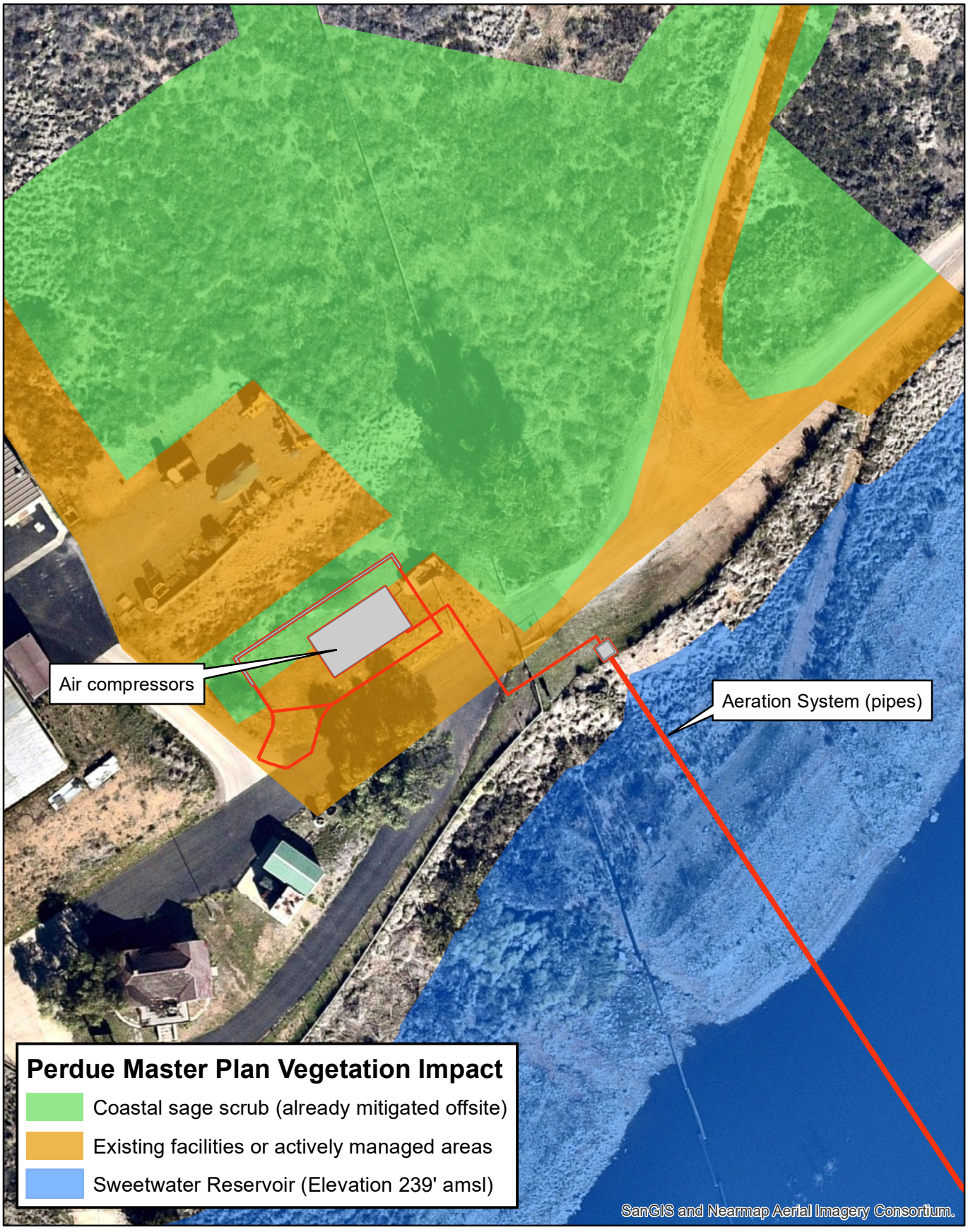


Figure 3. Vegetation and Land Covers

0 25 50 100 Feet

N

To estimate impacts to sensitive resources from the construction and operation of the Proposed Addition, Authority staff conducted a noise assessment and Authority's on-call environmental consultant prepared a wetland delineation.

On December 6, 2023, Authority staff conducted an additional noise assessment at the location where the two air compressors would be placed, to estimate any additional noise that could be added to the are as result of the operation of the proposed Project Addition, specifically the noise resulting from the operation of the two air compressors. Compressors similar to those planned to be used for the Project Addition produce approximately 69 dB at a less than 3-foot distance, and two of them operated at the same time were estimated to produce 72 dB when operated at the same time. 3 noise sources producing 75 dB each only, collectively could generate up to 79.7 dB. For the assessment conducted by Authority staff, a pre-recorded air compressor noise was played at the location where the proposed two compressors would be placed at 85 dB, which is a level significantly higher than the one expected to occur if the aeration system project moves forward. The additional noise was not measurable at a distance, near residential areas. From the proposed compressor location, the additional noise was measured ranging from 52 dBA at 170 feet horizontal-distance, to (1) 66 dBA at 90 feet horizontal-distance and 66 dBA at 77 a feet distance (on top of an adjacent cut slope). Other measurements taken from the proposed location of the two air compressors included noise levels at the edge of surrounding habitat areas, which included measurements of 58 dBA and 59 dBA to the south, and 54 and 56 dBA to the east. All measures were taken from the proposed location of the air compressors, without any engineered mitigating measures, like walls or fences.

The proposed aeration system, which consists of air compressors feeding a diffuser line attached to a buoyant air pipeline anchored just above the bottom of the reservoir, would de-stratify the water column with an upward stream of air bubbles. This vertical mixing and aeration will greatly improve the water quality in the reservoir and lake ecosystem. As discussed by WSP USA Environment & Infrastructure, Inc. (WSP) in the aquatic resources/ wetland delineation (July 2024, Attachment 2), while the installation of the aeration system in the lake may require permitting by the aquatic resources jurisdictional agencies, there would be no negative to the reservoir due to the installation of the aeration system, instead, the overall ecosystem of the lake will greatly improve, thus improving conditions for fish, native biological resources, and waterfowl.

Project area along reservoir shoreline facing north.

The potential impacts associated with the modified project implementation are discussed below.

Would the project:

a) ***Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or the USFWS?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan identified 1.19 acres of permanent

impacts and 0.11 acres of temporary impacts to coastal sage scrub habitat. As described in the 2006 EIR, coastal sage scrub habitat with the vicinity of the reservoir could supports the federally threatened California gnatcatcher. Removal of coastal sage scrub habitat and indirect construction noise could result in impacts to these listed species. As noted above, the 2006 EIR previously analyzed impacts to approximately 1.3 acres of coastal sage scrub habitat as well as indirect impacts to the California gnatcatcher and least Bell's vireo due to increased noise, vibration, and dust during construction. This impact to coastal sage scrub habitat has already been permitted by the wildlife agencies and mitigated through the provision of replacement habitat. The proposed Project Addition would not result in any additional impacts or any new upland areas of habitat removal that have not already been previously identified and mitigated. Further the proposed Project would be required to comply with all applicable mitigation measures identified in the 2006 EIR and any applicable permit conditions to ensure no additional impacts to sensitive species or sensitive habitats occur beyond those already discussed in the 2006 EIR and previously permitted by the wildlife agencies. This would include, but would not be limited to review of grading and construction plans; pre-construction biological resources education; temporary exclusion fencing at the edges of the proposed Project; timing restrictions on vegetation removal to avoid the breeding season of the California gnatcatcher and least Bell's vireo. Installation of the aeration system in the lake will follow all the applicable Best Management Practices (BMPs) during construction, per a SWPPP or similar stormwater management plan prepared for the project and any future permit conditions. As discussed in the 2006 EIR mitigation measures, when construction during the breeding season is unavoidable, an adaptive monitoring program would be implemented with monitoring performed by a qualified biologist possessing necessary species monitoring permits or otherwise approved by the state and federal wildlife agencies. Therefore, implementation of the proposed Project Addition would not result in any new impacts to special status species. In addition, and as noted above, while the installation of the aeration system in the lake may require permitting by the aquatic resources jurisdictional agencies, there would be no negative to the reservoir due to the installation of the aeration system; instead, the overall ecosystem of the lake will greatly improve, thus improving conditions for fish, native biological resources, and waterfowl. The conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS?*** The proposed Project would involve the landside construction of two air compressors in an area adjacent to an area that was previously mapped as coastal sage scrub habitat during the preparation of the 2006 EIR for the Robert A. Perdue Water Treatment Plant Master Plan (refer to Attachment 1, Figures 1.9 and 1.10). However, this EIR analyzed the removal of approximately 1.3 acres of coastal sage scrub habitat, which included this adjacent area. While some of the coastal sage vegetation hasn't been impacted as some of the components of the 2006 Master Plan haven't been built, this impact has already been mitigated through the provision of replacement habitat at the Skelton Mitigation Area. The proposed Project would not result in any additional impacts or any new areas of habitat removal that have not already been previously identified and mitigated. In the unlikely event that impacts to coastal sage occurs as result of the proposed Project Addition implementation, the Authority will coordinate with the wildlife agencies to ensure the appropriate measures are followed. The conclusions from the 2006 EIR still apply to the proposed Project.

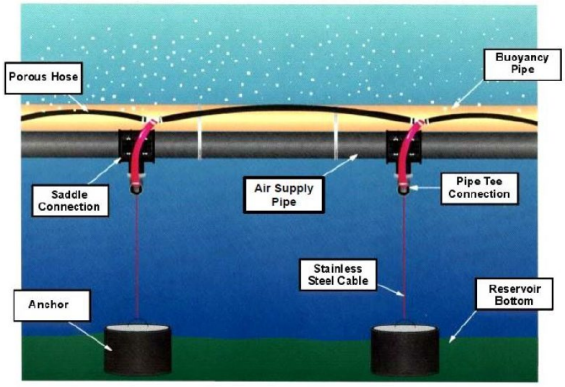
Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? As described in the Biological Resource Technical Report for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant

Activities, a wetland delineation was not performed for the proposed improvements at the Perdue WTP. However, the 2006 deferred the necessary permitting with the USACE for any impacts associated with installation of facilities below the high-water mark of the lake, as noted in biological mitigation no. 8, specifically the placement of rip-rap as a part of the proposed improvements at the Perdue WTP and the need for a Nationwide Permit. The mitigation measures identified in the 2006 EIR require that all permit requirements be implemented by the Authority. Environmental consulting firm WSP prepared an aquatic resources delineation report for the proposed Project (WSP 2024), given that the aeration system includes a pipe and anchors that would be installed within the reservoir, mapped as open waters. As described in the recent aquatic resource delineation, the Sweetwater Reservoir receives waters from the Sweetwater River flowing from the east and multiple smaller tributaries, and is periodically inundated based on storage capacity and water use needs of the Authority. The capacity of the reservoir extends to the 239 feet above mean sea level (amsl) and fluctuates to lower lake level elevations. Per the aquatic resources report, there aren't any native wetlands present within the Project Addition site, but only open waters or dry lake bottom with non-native opportunistic vegetation (disturbed vegetation), which only grows when the lake level is relatively low. As previously described, the underwater portion of the diffuser line would be anchored by concrete structures set at the bottom of the reservoir and tethered to the line by stainless steel cables. Therefore, it is likely that permits would be required under Section 404 of the CWA from the USACE, Section 401 Water Quality Certification from the RWQCB, and Section 1602 of the California Fish and Game Code from the CDFW.

Table 1. Summary of Fill Material Required for the Proposed Project

Project Component	Fill (Approximates)
Total Length of Pipe below 239 Feet	2,590 linear feet
Total Cubic Yard of Pipe Fill	72.15 cubic yards
Total Cubic Yards of Pipe Sleeve Supports	1.24 cubic yards
Total Cubic Yards of Anchors with Cables	4.42 cubic yards

The proposed Project would not have any adverse impacts to waters or wetlands. If anything, implementation of the proposed Project would greatly improve water quality and lake ecosystem conditions throughout the reservoir. As such, there would be no new or negative impacts to jurisdictional waters as a result of the proposed aeration and destratification system. In addition, a SWPPP or similar stormwater management plan will be prepared to minimize any potential for pollution of water and wetland resources as result of construction activities. The conclusions from the 2006 EIR still apply to the proposed Project.



The proposed 2,500-foot-long air diffuser line would be anchored by concrete structures set at the bottom of the reservoir and tethered to the line by stainless steel cables.

c) ***Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native***

wildlife nursery sites? As described in the EIR for the Robert A. Perdue Water Treatment Plant Master Plan, portions of the area surrounding the Perdue WTP are considered important wildlife corridors, connecting to natural lands in the lower Sweetwater River valley and San Diego National Wildlife Refuge. The 2006 EIR described that the required mitigation for impacts to coastal sage scrub habitat would provide more habitat and a more functional wildlife corridor and habitat linkage than that which was required for removal as a part of the improvements to the Perdue WTP. The proposed Project would not involve the construction of new roads, fencing, or any other linear structures that could interfere with the movement of any native resident or migratory wildlife species. Additionally, the proposed 2,500-foot-long air diffuser line would be anchored by concrete structures set at the bottom of the Sweetwater Reservoir and would not interfere with the movement of fish within the Reservoir. The proposed Project Addition would also greatly improve ecosystem conditions at the reservoir, likely creating a better habitat for native species that use or may use the lake. The conclusions from the 2006 EIR still apply to the proposed Project.

d) ***Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance?*** While the EIR for the Robert A. Perdue Water Treatment Plant Master Plan extensively discussed potential impacts to sensitive biological resources, it did not specifically describe potential conflicts with local policies and ordinances. The County's policy framework contains several policies relating to the conservation and protection of biological resources, including the Multiple Species Conservation Program (MSCP), Resource Protection Ordinance, Biological Mitigation Ordinance, and Habitat Loss Permit Ordinance. While the Sweetwater Reservoir and Project area are not within the County's MSCP boundaries, the Authority strives to be consistent with local plans or ordinances when proposing and implementing projects. With the implementation of the previously identified mitigation measures described above and the applicable permit conditions, the proposed Project would not conflict with any local policies or ordinances protecting biological resources.

e) ***Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*** Natural Community Conservation Plans (NCCPs) are state-sponsored programs endorsed by the federal government to balance the needs of urban development and economic growth with species and habitat protection. NCCPs employ a multi-habitat and multi-species conservation planning approach, focused on preserving the largest core habitat areas possible while protecting necessary habitat linkages and wildlife movement corridors necessary to maintain long-term biological and genetic diversity. The EIR for the Robert A. Perdue Water Treatment Plant Master Plan described the Authority's involvement in the preparation of the Joint Water Agency (JWA) NCCP, including a Subregional Plan and Subarea Plans (SAPs). At the time, the JWA NCCP was nearing completion. Expansion of the Perdue WTP was included as a covered project in the Authority's SAP. The JWA NCCP specifically addressed the expansion of the Perdue WTP and provided take authorizations for covered species and their habitats. However, while impacts to special status species and habitat were properly mitigated, the JWA NCCP was not ultimately completed and approved by wildlife agencies. As part of the programmatic permitting of the Authority's property operations and maintenance plan, the Authority is currently working again with CDFW and USFWS in the preparation of an NCCP/HCP, and has already identified multiple covered activities and drafted an initial conservation strategy, progressing towards the goal of having a complete draft NCCP/HCP by February 2026. The proposed Project Addition is not in conflict with the current NCCP/HCP effort as this aeration system is within operational areas, and identified as such in the current NCCP/HCP. The proposed Project Addition also greatly

benefits the reservoir and the lake ecosystem, which ultimately helps with the overall health of the adjacent undeveloped watershed areas and its ecosystems. As such, the Proposed Project would not conflict with the provisions of an adopted HCP/NCCP, or other approved habitat conservation plans.

16.5 CULTURAL RESOURCES

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5 of CEQA Guidelines?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of CEQA Guidelines?	☐	☐	☒	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

Would the project:

A Cultural Resources Technical Report was prepared in support of the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities. As described in the 2006 EIR, there are no known cultural resources located within or immediately adjacent to the area that would be impacted by construction or operation of the improvements to the Perdue WTP.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 of the CEQA Guidelines?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan determined that there are no known cultural resources within the Project site. However, the Sweetwater Dam is considered eligible for the National Register of Historic Places (NRHP) under Criteria A and C. Its significance stems from its importance as a composite structure illustrating how a marginal, largely reconstructed dam was transformed into a safe and useful structure that provided drinking water to the San Diego region (Mikesell 1998). Although not listed on the NRHP, the Sweetwater Dam, including the dam itself, the South Spillway, and the South Dike, are eligible for listing and as such are considered an historic property under NHPA. Further, and as resources in California determined eligible for the NRHP are automatically listed in or determined eligible for the CRHR, the Sweetwater Dam is also considered a historical resource, meeting Criteria 1 and 3 of the CRHR, pursuant to CEQA. Nevertheless, the proposed Project, including the construction of the 2,500-foot-long diffuser line and the two air compressors, would not result in an adverse change in the historical significance of the Sweetwater Dam. Furthermore, the installation of Proposed Addition facilities above the high-water mark of the lake would occur in areas previously disturbed by other projects that required major excavation for pipeline installation, such as the Sweetwater Reservoir Urban Runoff Diversion System Phase 1 (URDS-1). Given this, the likeliness of impacting an archaeological resource due to ground disturbance activities are unlikely. The conclusions from the 2006 EIR still apply to the

proposed Project. As required by the mitigation identified in the 2006 EIR, in the unlikely event that previously unknown resources are identified during construction activities work in that area shall be temporarily halted, while the find is assessed by a qualified archaeologist. If the find is determined to be eligible for the California Register, then a research design and data recovery program designed and implemented by a qualified archaeologist shall be prepared and carried out before ground-disturbing construction activities resume.

b) ***Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines?*** As previously described, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan determined that there would be no impacts to archaeological resources as a result of the proposed improvements to the Perdue WTP. The proposed Project Addition would result in the construction of two air compressors in an area that was previously surveyed as a part of the Cultural Resources Technical Report that was prepared for the 2006 EIR. While this area is not currently built, its surface is maintained and used for parking boats and it is located in close proximity to the Perdue WTP and other Authority facilities and roads. As described in the 2006 EIR, previous records searches and on-site pedestrian surveys have not identified any archaeological resources within the Project Addition site. The installation of underground facilities would occur in areas previously disturbed by other projects that included major excavation for pipeline installation, such as the URDS-1 project. Therefore, the proposed Project would not have the potential to result in an adverse impact to buried archaeological resources and the conclusions from the 2006 EIR still apply to the proposed Project. As required by the mitigation identified in the 2006 EIR, in the unlikely event that previously unknown resources are identified during construction activities work in that area shall be temporarily halted, while the find is assessed by a qualified archaeologist. If the find is determined to be eligible for the California Register, then a research design and data recovery program designed and implemented by a qualified archaeologist shall be prepared and carried out before ground-disturbing construction activities resume.

c) ***Disturb any human remains, including those interred outside of dedicated cemeteries?*** As previously described, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan determined that there would be no impacts to archaeological resources as a result of the proposed improvements to the Perdue WTP. The proposed Project Addition would result in the construction of two air compressors in an area that was previously surveyed as a part of the Cultural Resources Technical Report. While this area is not currently developed, it is located in close proximity to the Perdue WTP and other Authority facilities and roads. As described in the 2006 EIR, previous records searches and on-site pedestrian surveys have not identified any potential for human remains within the proposed Project Addition site. Therefore, the proposed Project Addition would not have the potential to result in an adverse impact and the conclusions from the 2006 EIR still apply to the proposed Project.

16.6 ENERGY

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

When the EIR for the Robert A. Perdue Water Treatment Plant Master Plan was prepared the Energy topic was not one of the resource areas identified in Appendix G of the CEQA Guidelines. Nevertheless, the 2006 EIR addressed energy consumption as a part of the Utilities / Service Systems analysis. As described therein, according to San Diego Gas & Electric (SDG&E), the increased energy consumption associated with the improvements to the Perdue WTP would not require additional primary feed for the operation of the facility. Additionally, the 2006 EIR found that the increased demands for electrical power were essential to project operations and would not represent excessive or inefficient use of energy. Recent installation of a hydro-electric turbine in an aqueduct, as described in the 2006 EIR, has also helped mitigate some of the energy uses at the treatment plant from the overall project, as described in the 2006 EIR and for any follow up phases.

Would the project:

a) ***Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*** As previously described the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities determined that there would be no potential for impacts related to energy use. The proposed aeration and destratification system would result in energy use from the operation of the two air compressors. However, the energy use associated with these air compressors would be minimal. The Authority has estimated an average annual energy use of 78 kilowatts (kW). Energy associated with these compressors would be negligible and would not result in the wasteful, inefficient, or unnecessary.

b) ***Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*** As described in Response 16.6(a), the proposed Project would result in a negligible increase in energy use. The proposed Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Therefore, there would be no impacts and the conclusions from the 2006 EIR still apply to the proposed Project.

16.7 GEOLOGY AND SOILS

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving:				

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
(i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area, or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
(ii) Strong seismic ground shaking?	☐	☐	☒	☐
(iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
(iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the 1994 California Building Code 1997, creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☒	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

Would the project:

The EIR for the Robert A. Perdue Water Treatment Plant Master Plan included a detailed analysis of Geology and Soils based on a Geotechnical Evaluation prepared by Ninyo & Moore (2005). This evaluation documents the geotechnical findings, conclusions, and recommendations regarding the proposed improvements.

The potential impacts associated with the proposed Project Addition are discussed below.

a) ***Directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving:***

i) ***Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan described that no known underlying active faults are located in the area. Sweetwater Reservoir is located in Southern California,

which is a seismically active region at the junction of the North American and Pacific tectonic plates. However, there are no known active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years) or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 2,000,000 years) in the immediate vicinity of the project area. The Elsinore Fault has been mapped approximately 38 miles east of the Sweetwater Reservoir and the Rose Canyon Fault has been mapped approximately 8 miles west of the Sweetwater Reservoir. Therefore, the 2006 EIR concluded that there would be no impacts associated with ground surface rupture due to faulting. The proposed aeration and destratification system, which would involve the construction of a 2,500-foot-long air diffuser line and two air compressors, would similarly result in no impacts associated with ground surface rupture due to faulting. The conclusions from the 2006 EIR still apply to the proposed Project.

ii) ***Strong seismic ground shaking?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan acknowledged that ground shaking as a result of earthquakes is a potential hazard throughout Southern California. The relative potential for damage from this hazard is dependent upon the type, magnitude, and location of an earthquake event. As described in Response 16.7(a)(i), there are no known underlying active faults are located in the area. The Rose Canyon Fault has been mapped approximately 8 miles west of the Sweetwater Reservoir. Therefore, there would be no impacts associated with strong seismic ground shaking and the conclusions from the 2006 EIR still apply to the proposed Project.

iii) ***Seismic-related ground failure, including liquefaction?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan described that liquefaction is a hazard associated with seismic activity, but concluded that due to the site location, elevation, and underlying materials, there would be no impacts associated with liquefaction. Soil liquefaction occurs within relatively loose, cohesion-less sands that are saturated from a relatively high groundwater table (less than 50 feet below ground surface). According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) database, the soil within the Project site is San Miguel rocky silt loam. This soil is not known to have stability issues. Therefore, there would be no impacts associated with seismic-related ground failure, including liquefaction. The conclusions from the 2006 EIR still apply to the proposed Project Addition.

iv) ***Landslides?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities described that no landslides or indications of deep-seated landslide activity have been identified in the vicinity of the Sweetwater Reservoir. Therefore, the 2006 EIR concluded that there would be no impacts associated with landslides as a result of the proposed improvements to the Perdue WTP. Similarly, no impacts associated with landslides are anticipated to occur with the proposed Project. The conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Result in substantial soil erosion or the loss of topsoil?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities addresses erosion as a part of the Hydrology and Water Quality analysis. The 2006 EIR concluded that the proposed improvements to the Perdue WTP could result in sediment contamination resulting from grading and required coverage under the State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit, including the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The proposed Project would result in minimal erosion related construction associated with the

proposed construction activities. No major grading or soil export would be required. As described in Response 16.10(a), compliance with the Statewide General Construction Permit (Order WQ 2022-0057-DWQ; NPDES No. CAS000002) or similar stormwater management plan, and compliance with the Clean Water Act Section 401 Water Quality Certification permit, as applicable, would ensure that the proposed Project Addition would not result in the substantial erosion or the loss of topsoil. The conclusions from the 2006 EIR still apply to the proposed Project.

c) ***Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?*** As described in the Response 16.7(a)(iii) and Response 16.7(a)(iv), the proposed Project Addition would not result in impacts related to unstable soils. The conclusions from the 2006 EIR still apply to the proposed Project.

d) ***Be located on expansive soil, as defined in Table 18-1-B of the 1994 California Building Code 1997, creating substantial risks to life or property?*** The proposed Project would not involve construction on expansive soil, as defined in Table 18-1-B. As described in Response 16.7(a)(iii), the soil within the Project site is San Miguel rocky silt loam. This soil is not known to have stability issues. The conclusions from the 2006 EIR still apply to the proposed Project.

e) ***Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan did not specifically address septic tanks or alternative wastewater disposal systems. However, the proposed Project would not involve the construction of new habitable facilities or office space that would require the use of septic tanks or alternative wastewater disposal systems. Therefore, there would be no impact.

f) ***Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*** As described in the EIR for the Robert A. Perdue Water Treatment Plant Master Plan the geologic formations underlying the Project site are Santiago Peak Volcanics, weathered volcanics, and fill. Specifically, metavolcanic rock within the Santiago Peak Volcanics was observed during geological site reconnaissance. This geologic formation is rated with a marginal sensitivity level for paleontological resources. Marginal sensitivity is assigned to geologic formations that are composed either of volcanic rocks or high-grade metasedimentary rocks, but which nevertheless have a limited probability for producing fossil remains from certain sedimentary lithologies at localized outcrops. The proposed Project Addition would not result in the loss of known paleontological resources during construction of the proposed aeration and destratification system; all grading would be very minor and excavation for underground facilities would occur in areas previously disturbed. The conclusions from the 2006 EIR still apply to the proposed Project Addition.

16.8 GREENHOUSE GAS EMISSIONS

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Would the project:

When the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities was prepared Greenhouse Gas Emissions was not one of the resource areas identified in Appendix G of the CEQA Guidelines. Therefore, greenhouse gas (GHG) emissions were not quantified or analyzed.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?*** The proposed Project would result in an increase in GHG emissions associated with construction and operation of the proposed aeration and destratification system. However, this new aeration system would replace an abandoned and broken aeration system and the GHG emissions associated with the proposed air compressors would be minimal. Additionally, the air compressors would not be operated continuously, instead they would be used intermittently when existing water quality conditions require it. For example, during the months of July and August it is anticipated that use of the air compressors would not be required. In addition, the already operational hydro-electric turbine built as described in the 2006 EIR, already mitigates some of the total emissions from the Project. Therefore, GHG emissions would not have a significant impact on the environment.

b) ***Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*** As described in Response 16.8(a), the proposed Project would result in a negligible increase in GHG emissions and would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

16.9 HAZARDS AND HAZARDOUS MATERIALS

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in safety hazard for people residing or working in the project area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☒	☐

Would the project:

The EIR for the Robert A. Perdue Water Treatment Plant Master Plan included a detailed analysis of Hazards and Hazardous Materials, which included reference to the Emergency Planning and Response for Sweetwater Authority and the Operating Procedures for Sweetwater Authority, both of which were prepared by Tracer Environmental Sciences and Technologies. The 2006 EIR determined that construction activities may create potential impacts related to the safety of construction workers and the public. To avoid such hazards, the 2006 EIR required the preparation of a construction plan to ensure safe conditions. With regard to operational hazards, such as accidental spills and releases of hazardous materials, the 2006 EIR referenced the Authority's emergency planning guidelines provided in the Emergency Planning and Response for Sweetwater Authority and the Operating Procedures for Sweetwater Authority. The operating procedures discuss the operation of the equipment, containers/tanks, and feed systems at Perdue WTP and explicit steps for responding to leaks, shutdown procedures, reporting events, and post-event start up procedures. The Emergency Response Planning and Response report specifies emergency notification procedures, evacuation responses, emergency training, and incident reporting.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*** As described in the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities construction activities would involve the use of hazardous materials and the generation of hazardous waste that may

create potential significant impacts to the safety of project workers and the public. To avoid such hazards, the following measures from the previous EIR would be implemented:

Construction Measures

Safety for project workers and the public during project construction is governed by California Occupational Safety and Health Administration (CalOSHA) and requires that contractors have a general health and safety plan with safe work practices. For the proposed Project, such a plan would address items such as following safe construction work practices, following plans and specifications for proper staging areas, clearly identifying vehicular and pedestrian access routes; installation of proper signage, cones, fences, and barricades around construction sites, especially during non-construction working hours; and following the Authority's Risk Management Plan and Process Safety Management Plan. The Project site is completely within the existing Perdue WTP property and is not open to the public; however, ingress and egress of construction equipment and trucks to and from the Project site would be restricted to a designated haul route and construction times to ensure the safety of the public. In addition, prior to site development involving soil excavation, grading, or other subsurface disturbance, contractors will familiarize with adopted Authority contingency plan for the possibility of encountering localized areas of potential hazardous materials concern, including areas where chemical spills may occur. The plan shall address monitoring of excavated soil, community and worker health and safety, and soil handling, stockpiling, characterization, on-site reuse, export, and disposal protocols. Appropriate references to the potential to encounter contaminated soils shall be included in construction specifications. Below are mitigation measures developed for the 2006 EIR, which continue to be applicable. For more information on mitigation measures developed to minimize impacts related to hazardous materials, please refer to the 2006 EIR.

Operation Measures

Sweetwater Authority is subject to standards covering areas such as written process safety information, process hazard analysis and evaluation, operating procedures, training, and emergency planning and response. The Authority currently has the appropriate safety protocols in place, as described in the Authority's Risk Management Plan and Process Safety Management Plan, to ensure the safety of its employees and the public.

Emergency Planning and Response

The Authority and its employees are obligated to report all significant releases or potential releases of hazardous materials. Specific protocols are established to report, evaluate, and identify the extent and details of the releases and the nature of the release to appropriate and designated individuals on the Authority staff and outside assistance personnel. A contact list (names and numbers) and protocol are provided. Evacuation procedures and locations as well as response actions are included in the Authority's Risk Management Plan and Process Safety Management Plan. A hazardous material incident report form is also included with a list of emergency equipment and the location of the equipment. Emergency training is available and required for Authority personnel and contractors.

With the implementation of the Authority's Risk Management Plan and Process Safety Management Plan, and other BMPs outlined in the SWPPP for the construction project and

the construction documents, the impacts associated with the proposed Project would be less then significant and the conclusions from the 2006 EIR still apply.

b) ***Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*** The proposed Project Addition consists of the installation of an aeration system operated by electrical compressors, and the use of hazardous materials for the life of the operation will be minimal or non-existent. As described in the Response 16.9(a), with the implementation of the mitigation measures described in the EIR for the Robert A. Perdue Water Treatment Plant Master Plan, the proposed Project Addition would not result in impacts related to accidental spills and releases of hazardous materials. The conclusions from the 2006 EIR still apply to the proposed Project.

c) ***Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities did not specifically address the hazardous emissions or the handling of hazardous materials within close proximity to an existing or proposed school. However, the proposed Project would not result in the emissions or handling of hazardous materials, substances, or wastes within 0.25-mile of an existing or proposed school. The school located nearest to the project area is Sunnyside Elementary School, approximately 1.5 miles away. In addition, no hazardous materials, substances, or waste would occur as result of the construction or operation of the proposed Project Addition. Therefore, no impacts are anticipated to occur as a result of the proposed Project.

d) ***Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan did not specifically address known hazardous materials sites compiled pursuant to Government Code 65962.5. However, environmental regulatory database lists were reviewed to identify and locate properties with known hazardous substance contamination in the vicinity of the Project site. The project vicinity is a water treatment plant with strict protocols as it relates to hazards to the public or the environment. The Project site is not located on a list associated with hazardous materials and thus program activities do not occur on a hazardous materials site that could create a risk to the public or the environment.

e) ***For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan did not specifically address airport land use plans. However, the nearest public airport, Brown Field Municipal Airport, is located approximately 8.5 miles from the Project site area. The proposed Project would not create a safety hazard associated with airport operations for people residing or working in the vicinity because no airports or private airstrips are located within 2 miles of the proposed Project Addition site.

f) ***Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan did not specifically address adopted emergency response or evacuation plans. The County maintains a comprehensive Flood Warning System that assesses flood

risk and provides advance warning of impending flooding (County of San Diego Department of Public Works 2019). Other response plans or emergency evacuation plans include those prepared for wildfires or those prepared by the Authority for treatment plant operations, including the Authority's Risk Management Plan and Process Safety Management Plan. However, the proposed Project Addition, which includes the installation of an aeration system and two compressors, would not result in changes that would interfere with emergency response or evacuation plans related to flooding or any other natural hazards.

g) ***Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan did not specifically address wildland fires. However, as described in Section 16.20, *Wildfire*, the proposed Project would not add habitable structures that could be exposed to fire risk. The proposed Project would not change the fire hazard severity zones and long-term use would not impact response times of local fire departments. The proposed Project would have no impacts related to exposing people or structures to a significant risk of loss, injury or death involving wildland fires. As a feature and in coordination with the Fire Authority Having Jurisdiction, the proposed Project would remove vegetation from any facility, per the applicable Fire Code. Therefore, no impacts are anticipated to occur.

16.10 HYDROLOGY AND WATER QUALITY

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☐	☒
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:			☒	☐
(i) Result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐
(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;	☐	☐	☒	☐
(iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐
(iv) Impede or redirect flood flows?	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
f) Place housing within a I00-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☒	☐
g) Place within a I00-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
i) Be subject to inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

Would the project:

a) ***Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?*** Implementation of the Proposed Project Addition would improve water quality significantly at Sweetwater Reservoir. The Sweetwater Reservoir is a drinking water reservoir that receives water from the Sweetwater River watershed, as well as imported water from the San Diego County Water Authority, with the quality affected by upstream watershed development and activities. Surface and ground waters flowing into Sweetwater Reservoir are treated at the Perdue WTP prior to delivery to Authority customers. The Authority also supplements its local water supply with treated water purchased from the San Diego County Water Authority. According to the SWRCB, the Lower Sweetwater River, which is located within the Sweetwater hydrologic unit, is included on the 303(d) List of Impaired Waters for Enterococcus, Fecal Coliform, Phosphorus, Selenium, Total Dissolved Solids, Total Nitrogen, and toxicity (SWRCB 2016). Additionally, the Sweetwater Reservoir is listed on the 303(d) List of Impaired Waters for dissolved oxygen (SWRCB 2016).

As described in the 2006 EIR, potential impacts to hydrology and water quality could result from inadequate containment of sediment from grading and other construction activities and from fuels associated with construction equipment, such as from leaks or during maintenance and fueling. In addition, equipment storage areas and trash receptacles could pose potential significant impacts to water quality if they are not properly managed and maintained. The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities also described that the groundwater table in the area is located below the depths of the proposed improvements to the Perdue WTP. Therefore, the 2006 EIR concluded that there would be no impact related to groundwater. However, the 2006 EIR identified that a potential significant impact to surface water could occur as a result construction and operational activities. Nevertheless, the operation of the proposed Project Addition, which is a new aeration system with the sole purpose of improving water quality at the reservoir, would greatly benefit water quality at the reservoir and during the treatment process. During construction, the project would be subject to the Statewide General Construction Permit or similar stormwater pollution management plan. The construction stormwater management plan shall include a description of BMPs that the applicant will employ during construction, a monitoring program to ensure implementation of the BMPs, a list of responsible parties and contacts, and other details of construction activities. The stormwater management plan shall be a working document that is updated and modified throughout construction to detail any changes in implementation of

BMPs, any noncompliance, and resolution thereof. Compliance with the Statewide General Construction Permit or similar applicable stormwater management plan would ensure that there would be no impacts to hydrology and water quality.

After construction and over the long-term, the operation of the proposed aeration and destratification system would significantly improve water quality and the overall lake ecosystem of the Sweetwater Reservoir, reduce treatment costs at the Robert A. Perdue Water Treatment Plant, and expand the yield from the reservoir. An aeration system would ensure consistent levels of dissolved oxygen and water quality throughout the water column, which would improve the treatability of water in the Reservoir by reducing the occurrence of taste and odor causing algae blooms, reduce levels of dissolved manganese (color), reduce nutrient loading from the sediment into the water column, and improve the stability of the chloramine residual in the treated water by reducing TOC levels. As such, the proposed aeration system would not have a negative impact on water quality, but would result in direct benefits to water quality and the reservoir ecosystem. The proposed aeration system would present a pathway to remove Sweetwater Reservoir from the SWRCB's 303(d) List of Impaired Waters for dissolved oxygen.

b) ***Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?*** As described in Response 16.10(a), the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities described that the groundwater table in the area is located below the depths of the proposed improvements to the Perdue WTP. Therefore, the 2006 EIR concluded that there would be no impact related to groundwater. The proposed Project would not increase or decrease groundwater supplies. The operation of the proposed Project would not result in any increase in water demand and would not affect groundwater infiltration within the vicinity of the Reservoir. The conclusions from the 2006 EIR still apply to the proposed Project.

c) ***Substantially alter the existing drainage pattern of the site or area including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:***

   i) ***Result in substantial erosion or siltation on- or off-site?*** As described in Response 16.10(a), compliance with the Statewide General Construction Permit or similar stormwater management plan would ensure that the proposed Project Addition would not result in the substantial erosion or the loss of topsoil. In addition to this, none of the existing drainage patterns of the site or area will be impacted by the proposed Project Addition. The conclusions from the 2006 EIR still apply to the proposed Project.

   ii) ***Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site?*** A drainage technical memorandum was prepared in support of the EIR for the Robert A. Perdue Water Treatment Plant Master Plan, which determined that there would be no increase in runoff or velocity as a result of the improvements to the Perdue WTP. This drainage assessment focused on additional paved areas or areas that would be covered by new facilities. The proposed Project would neither alter existing drainage patterns nor the course of any stream or river that would result in flooding on- or off-site. The proposed Project would not involve any physical changes to the environment that would contribute or create runoff water that would exceed the capacity of existing drainage systems or provide a substantial source of polluted runoff. A relatively small area would be paved for the placement of two compressors, but this would

not affect any runoff amounts which could result in flooding on or off the site. The conclusions from the 2006 EIR still apply to the proposed Project.

iii) ***Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?*** As described in Response 16.10(c)(ii), the proposed Project Addition would not involve any physical changes to the environment that would contribute to or create significant additional runoff water that would exceed the capacity of existing drainage systems in the vicinity and downstream, or provide a substantial source of polluted runoff. The conclusions from the 2006 EIR still apply to the proposed Project.

iv) ***Impede or redirect flood flows?*** As described in Response 16.10(c)(ii), the proposed Project would not involve any physical changes to the local watershed or drainage patters that would impede or redirect flood flows. The conclusions from the 2006 EIR still apply to the proposed Project.

d) ***In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities described that tsunamis are not considered as a design constraint on the proposed improvements to the Perdue WTP. However, the 2006 EIR did not specifically address impacts related to flood hazards or seiche zones. According to the Federal Emergency Management Agency (FEMA), the Project area is located in Flood Zone X (Area of Minimal Flood Hazard) (FEMA 2012). The aeration system would be anchored to the reservoir bottom and below all wave action, which would prevent any issues associated with seiche. While the shoreline portion is exposed, it would be fully anchored with footings. The proposed Project would not increase the risk associated with flood hazards or seiche beyond existing conditions.

e) ***Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan described that continued operation of the Sweetwater Reservoir water treatment facilities would be conducted in a manner consistent with the Water Quality Control Plan for the San Diego Basin. The proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Additionally, the proposed Project would not substantially increase the amount impervious surfaces or result in increased demand for water supply (refer to Response 16.10[b]) and therefore would not impact or otherwise affect compliance with a sustainable groundwater management plan. As noted above, the proposed Project involves the construction and operation of an aeration system, which would ultimately benefit water quality at the reservoir and treatment plant, further helping achieving federal and state water quality improvement goals, such as the eventual delisting of the reservoir for issues associated with dissolved oxygen. The conclusions from the 2006 EIR still apply to the proposed Project. Furthermore, implementation of the proposed Project Addition would help improve water quality at the reservoir, helping meet the goals and water quality objectives of The Basin Plan for the San Diego region.

f) ***Place housing within a l00-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?*** As described in Response 16.10(d), the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant did not specifically address impacts related to housing impacts related to flood hazards. Nevertheless, the Project area is located in Flood Zone X an “Area

of Minimal Flood Hazard" (FEMA 2012). Additionally, the proposed project would not involve any housing. Therefore, the proposed Project would not place any housing within the 100-year floodplain.

g) ***Place within a l00-year flood hazard area structures which would impede or redirect flood flows?*** As described in Response 16.10(d) and Response 16.10(f), the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant did not specifically address impacts related to flood hazards. Nevertheless, the Project site is located in Flood Zone X an "Area of Minimal Flood Hazard" (FEMA 2012). The proposed Project would neither alter existing drainage patterns nor the course of any stream or river that would result in flooding on- or off-site. The aeration system pipe will be properly anchored to the bottom and shore of the reservoir, minimizing any hazards, and incoming flows would not have an impact on the aeration system or any other structures at typical reservoir levels, as result of the implementation of the proposed Project.

h) ***Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?*** As described in Response 16.10(d) and Response 16.10(f), the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant did not specifically address impacts related to flood hazards. Nevertheless, the Project site is located in Flood Zone X an "Area of Minimal Flood Hazard" (FEMA 2012). Additionally, the proposed Project Addition site is not located immediately downstream of the Sweetwater Dam or the South Dike and would not be subject to flooding and associated loss in the unlikely event of dam failure. The in-water components of the aeration system will be properly anchored to the bottom and shore of the reservoir such that any hazards resulting from flooding are minimized.

i) ***Be subject to inundation by seiche, tsunami, or mudflow?*** As described in Response 16.10(d) the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities described that tsunamis are not considered as a design constraint on the proposed improvements to the Perdue WTP. However, the 2006 EIR did not specifically address impacts related to seiche or mudflow. According to FEMA, the proposed Project Addition site is located in Flood Zone X (Area of Minimal Flood Hazard) (FEMA 2012). Additionally, as described in Response 16.7(iv), no landslides or indications of deep-seated landslide activity have been identified in the vicinity of the Sweetwater Reservoir. Therefore, the proposed Project Addition would not increase the risk of inundation by seiche or mudflow.

16.11 LAND USE AND PLANNING

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Physically divide an established community?	☐	☐	☒	☐
b) Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

Would the project:

a) ***Physically divide an established community?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities did not specifically address the potential for division of an established community. However, the proposed Project would not involve changes in land use nor would it involve construction near any established communities. The proposed Project would not divide any established communities either. Therefore, the proposed Project would not physically divide an established community.

b) ***Cause a significant environmental impact due to conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities described that the proposed improvements to the Perdue WTP would be focused within and adjacent to the existing treatment plant facilities. The 2006 EIR concluded that these improvements would be consistent with the long-term use of the proposed Project Addition site and would comply with federal and state drinking water standards. As with the original improvements, the proposed Project has been evaluated with regard to potential air quality impacts (refer to Section 16.3, *Air Quality*) and noise impacts (see Section 16.13, *Noise*) that could adversely affect residential land uses on adjacent property. The proposed Project would comply with any applicable mitigation measures from the 2006 EIR to minimize the nuisance of fugitive dust during site grading. Additionally, construction noise would be within the limits prescribed by the County's Noise Ordinance. Based on these determinations, the temporary nature of the construction activities, distance to any housing development, and the absence of other potential significant impacts on adjacent residential land uses from the proposed project improvements, potential land use impacts are considered to be less than significant. The conclusions from the 2006 EIR still apply to the proposed Project.

16.12 MINERAL RESOURCES

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☒	☐
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☒	☐

Would the project:

In Chapter 6, *Environmental Effects Found Not to be Significant*, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities determined that the improvements at the Perdue WTP are located on previously developed property that is not suitable for mineral extraction. The 2006 EIR concluded that the expansion of the Perdue WTP would not result in the loss of available known regional or local mineral resources.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?*** According to the California Department of Conservation (DOC), the entire Sweetwater Reservoir area is classified as a Surface Mining and Reclamation Act (SMARA) study area. The San Diego County General Plan Conservation and Open Space Element designates the Sweetwater Reservoir and surrounding area as Mineral Resource Zone (MRZ) 3 (Resource potentially present) (County of San Diego 2011). The proposed Project would require or result in minor ground-disturbing activities. However, there would be no change in impacts to mineral resources or access to them and all project activities would occur on areas designated to operations of a water district. The conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*** As described in Response 16.12(a), the Sweetwater Reservoir is designated in the San Diego County General Plan Conservation and Open Space Element as MRZ 3. The proposed Project would involve both temporary and permanent ground disturbing activities, but these activities are of minor nature, adjacent to a treatment plant, and would not preclude the future availability of a locally important mineral resource site as there are none within project area. The conclusions from the 2006 EIR still apply to the proposed Project.

16.13 NOISE

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

In 2006, noise level measurements were collected in support of the EIR for the Robert A. Perdue Water Treatment Plant Master Plan. The predominant noise source within the vicinity of the Perdue WTP was from aircraft passing overhead. The water treatment plant machinery was inaudible at the proposed expansion site and at the water treatment plant property boundaries. SR 125 traffic was barely perceptible at the northwest corner of the site. Other noise sources included birds chirping, occasional dog barks, distant construction equipment, and landscaping activities (e.g., leaf blowers and lawn mowers). The 2006 EIR described that noise from general site preparation and grading would be made by dump trucks, backhoes, bulldozers, and other heavy construction equipment. Maximum unshielded noise could reach levels as high as 65 A-weighted decibels (dBA). Maximum construction noise levels at the nearby residences would be heard above the existing noise levels

and could create temporary annoyance; however, it should be noted that maximum noise levels would occur only sporadically since not all equipment would be operating at all times. The average hourly noise levels at the nearest property line with residential land uses would be similar to noise generated during demolition and would comply with the County Noise Ordinance.

On December 6, 2023, Authority staff conducted an additional noise assessment at the location where the two air compressors would be placed, to estimate any additional noise that could be added to the are as result of the operation of the proposed Project Addition, specifically the noise resulting from the operation of the two air compressors. Compressors similar to those planned to be used for the Project Addition produce approximately 69 dB, and two of them operated at the same time were estimated to produce 72 dB when operated at the same time. 3 noise sources producing 75 dB each only, collectively could generate up to 79.7 dB. For the assessment conducted by Authority staff, a pre-recorded air compressor noise was played at the location where the proposed two compressors would be placed at 85 dB, which is a level significantly higher than the one expected to occur if the aeration system project moves forward. The additional noise was not measurable at a distance, near residential areas. From the proposed compressor location, the additional noise was measured ranging from 52 dBA at 170 feet horizontal-distance, to (1) 66 dBA at 90 feet horizontal-distance and 66 dBA at 77 a feet distance (on top of an adjacent cut slope). Other measurements taken from the proposed location of the two air compressors included noise levels at the edge of surrounding habitat areas, which included measurements of 58 dBA and 59 dBA to the south, and 54 and 56 dBA to the east.

The potential impacts associated with the modified project implementation are discussed below.

Would the project:

a) ***Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*** As described in the EIR for the Robert A. Perdue Water Treatment Plant Master Plan, construction activities associated with the proposed Project would result in a short-term increase in noise associated with heavy construction equipment. Typical noise levels from construction equipment are shown in Table 2. However, the Project site is located approximately 800 feet from the nearest sensitive receptors to the northeast. At this distance, construction noise levels would range from 41 dBA to 64 dBA. Additionally, existing topography blocks the line of sight of the Project site to the nearest residence, which would further reduce noise levels by an at least an additional 5 dBA. As described in the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities construction activities would comply with the County Noise Ordinance and no additional mitigation measures would be necessary.

Table 2. Typical Construction Noise Levels

Construction Phase	Maximum Noise level at 50 feet - dBA	
	Minimum Required Equipment On-Site	All Pertinent Equipment On-Site
Ground Clearing	83	83
Excavation	75	88
Foundation/Conditioning	81	81
Paving	65	81

Finishing and Cleanup	72	88

Source: USEPA 1971; Authority 2006.

The proposed aeration and destratification system would involve the use of two air compressors, which would result in an increase in noise in the immediate vicinity of the area when in use. Using conservative estimates and assuming each air compressor produces a noise level of 69 dBA at 3 feet, operation of the proposed air compressors would result in a noise level of 72 dBA at 3 feet (two air compressors at 69 dBA each). At a distance of 800 feet to the nearest residential land use, noise levels would be less than 25 dbA, which would not be perceptible. It should be noted that the air compressors are not anticipated to be operated continuously throughout the year, instead they would be intermittently when existing water quality conditions require it. Similarly, compressors would not be operated year-round. For example, during certain months of the year, it is anticipated that use of the air compressors may not be required. Therefore, noise levels associated with the proposed aeration and destratification system would remain well within the standards established in the County's general plan and noise ordinance. In addition, the compressor area would be covered by wall or fence, further attenuating any noise resulting from the operation of the compressors. The conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Generation of excessive groundborne vibration or groundborne noise levels?*** The EIR for the Robert A. Perdue Water Treatment Plant Master Plan described that the most substantial vibration sources associated with the proposed improvements to the Perdue WTP would be construction activities associated with grading and site preparation. However, vibration levels would remain well below the 0.1 inches per second (in/sec) threshold of annoyance at distances between 30 and 40 feet. The proposed Project would involve minimal grading and site preparation associated with the proposed air compressors and would not result in the temporary or permanent introduction of groundborne vibration or groundborne noise. The conclusions from the 2006 EIR still apply to the proposed Project Addition.

c) ***For a project located within a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*** As described in Response 16.9(e), the EIR for the Robert A. Perdue Water Treatment Plant Master Plan `did not specifically address airport land use plans. However, the nearest public airport, Brown Field Municipal Airport, is located approximately 8.5 miles from the Project site area. The proposed Project would not expose people residing or working in the Project site to excessive noise levels.

16.14 POPULATION AND HOUSING

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

Would the project:

In Chapter 6, *Environmental Effects Found Not to be Significant*, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities described that the objective of the proposed improvements to the Perdue WTP was to meet existing and projected water demand due to previously planned growth within the area. The 2006 EIR described that the proposed improvements would not affect the local or regional population or housing as they would not induce substantial population growth in the area. Further, the proposed improvements would not displace existing housing or people or be located on a site designated for residential development.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?*** The Sweetwater Reservoir provides a water supply to local residents and the existing community. The proposed Project Addition would not result in any change to the existing land use pattern or trigger growth in the area. The conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*** There are no planned large-scale housing or commercial developments within the immediate area. The proposed Project Addition site is not zoned for or developed as residential uses. The Project Addition would not displace anyone or need the construction of replacement housing. The conclusions from the 2006 EIR still apply to the proposed Project.

16.15 PUBLIC SERVICES

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
(i) Fire Protection?	☐	☐	☒	☐
(ii) Police Protection?	☐	☐	☒	☐
(iii) Schools?	☐	☐	☒	☐

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
(iv) Parks?	☐	☐	☒	☐
(v) Other public facilities?	☐	☐	☒	☐

Would the project:

In Chapter 6, *Environmental Effects Found Not to be Significant*, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan described that the proposed improvements to the Perdue WTP would provide improved water service to accommodate previously planned growth within the service area. The 2006 EIR concluded that the indirect effect on public services resulting from the proposed improvements would not be substantially adverse.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:***

i) ***Fire protection?*** The proposed Project would not trigger economic growth such that new residents would be attracted to the area and would not require or result in construction of any structures that would require additional fire protection services. The entire project will be installed within an area already covered by a fire district, the San Miguel Fire and Rescue District. The conclusions from the 2006 EIR still apply to the proposed Project.

ii) ***Police protection?*** Refer to Response 16.15(a)(i). The proposed Project would not require changes in law enforcement services and it would not include any new housing, businesses, or other development that would increase the demand for police protection services and facilities. The conclusions from the 2006 EIR still apply to the proposed Project.

iii) ***Schools?*** Refer to Response 16.15(a)(i). The proposed Project would not provide any new housing or employment opportunities that would generate new students or residents in the community. The conclusions from the 2006 EIR still apply to the proposed Project.

iv) ***Parks?*** Refer to Response 16.15(a)(i). The proposed Project would not increase the demand for new or expanded park facilities. The conclusions from the 2006 EIR still apply to the proposed Project.

v) ***Other public facilities?*** Refer to Response 16.15(a)(i). No other public facilities would be impacted by the proposed Project. The lake ecosystem will benefit from the implementation of the project, which would result in benefits to the fishing program on the south side of the lake, and better water quality at the treatment plant and the service area. The conclusions from the 2006 EIR still apply to the proposed Project.

16.16 RECREATION

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☒	☐

Would the project:

In Chapter 6, *Environmental Effects Found Not to be Significant*, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities described that the proposed improvements to the Perdue WTP would not create a demand for recreational facilities or allow for recreational uses at the Sweetwater Reservoir. As described in Section 16.11, *Land Use and Planning*, the proposed improvements to the Perdue WTP would not be in conflict with existing and planned recreational facilities in the area.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*** The proposed Project would not result in physical deterioration of existing recreational facilities. Further, the proposed Project would not increase the population by introducing new housing or employment opportunities. Implementation of the proposed Project Addition would improve water quality at the Sweetwater Reservoir, likely improving fisheries at the lake as a direct result. The experience of fisher men and women at the Fishing Program may ultimately be benefited by the implementation of the proposed Project Addition. The conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?*** As described in Response 16.16(a), the proposed Project would not result in physical deterioration of or otherwise require the construction or expansion of recreational facilities. The conclusions from the 2006 EIR still apply to the proposed Project.

16.17 TRANSPORTATION

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
a) Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☒	☐
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3 or will conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐

Would the project:

In Chapter 6, *Environmental Effects Found Not to be Significant*, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan described that the proposed improvements to the Perdue WTP would involve construction traffic, including employee vehicle trips and materials delivery trips. However, construction traffic would be temporary in nature and would not block emergency access to nearby uses. During the project construction phase, project-related trucks and equipment would use streets serving residential areas limited to particular times during the day and would not occur every day. Advance notification would be provided to residents along construction access routes and traffic control when warranted. Construction staging and parking areas would be located on-site within the Sweetwater Reservoir property. No impacts to adjacent residential neighborhoods, parks and other public facilities, or other existing land uses due to insufficient parking would occur as a result of the proposed construction. Upon completion of project construction, traffic associated with operation of the facility would not substantially increase over existing conditions. A minimal increase in people (i.e., less than ten) at the Perdue WTP would be expected, and delivery of materials to the plant would be very similar to the existing delivery schedule.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Conflict with program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?*** The proposed Project would not adversely affect the circulation system, including transit, bicycle, and pedestrian facilities. Therefore, the proposed Project would not conflict with any program plan, ordinance, or policy addressing the circulation system. The conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Conflict or be inconsistent with CEQA Guidelines Section 15064.3 or will conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?*** The amount of vehicle trips during construction of the propose aeration and destratification system would

not conflict with an applicable congestion management program since as vehicle traffic would not approach 2,400 average daily trips or 200 peak-hour trips, which would require a traffic study under SANDAG's Congestion Management Program (County of San Diego Land Use and Environment Group 2021). The operations of the aeration system would not conflict with any congestion management program or create any traffic as the system will be operated and maintained by Authority staff already available at the treatment plant. The conclusions from the 2006 EIR still apply to the proposed Project.

c) ***Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*** The proposed Project would not include any change to public roadway designs and would not introduce incompatible uses or line-of-sight issues. The conclusions from the 2006 EIR still apply to the proposed Project.

d) ***Result in inadequate emergency access?*** The proposed Project would not conflict with an emergency response plan and would not impair or otherwise interfere with emergency access to local roads. The proposed Project would not result in traffic delays that could substantially increase emergency response times or reduce emergency vehicle access. The conclusions from the 2006 EIR still apply to the proposed Project.

16.18 TRIBAL CULTURAL RESOURCES

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or	☐	☐	☒	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐

Would the project:

When the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities was prepared Tribal Cultural Resources was not one of the resource areas identified in Appendix G of the CEQA Guidelines. Nevertheless, the 2006 EIR addressed archaeological resources as a part of the Cultural Resources analysis. As described therein, there are no known cultural

resources located within or immediately adjacent to the area that would be impacted by construction or operation of the improvements to the Perdue WTP.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:***

   i) ***Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?*** The proposed Project would result in the construction of two air compressors. While this area is not currently paved, it is already graded and currently used as a parking area for boats and other lake equipment, and located in close proximity to the Perdue WTP and other Authority facilities and roads. As described in Response 16.5(b), previous records searches and on-site pedestrian surveys have not identified any archaeological resources within the Project Addition site, and significant portion of the proposed project area have been previously disturbed by previous improvements, including the construction of the URDS-1 and the clearwell. The proposed Project would not have the potential to result in an adverse impact to tribal cultural resources. In the unlikely event that previously unknown resources are identified during construction activities work in that area should be temporarily halted, while the find is assessed by a qualified archaeologist. If the find is determined to be eligible for the California Register, then a research design and data recovery program designed and implemented by a qualified archaeologist shall be prepared and carried out before ground-disturbing construction activities resume.

   ii) ***A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1?*** As described in Response 16.5(b) and Response 16.18(a)(ii), previous records searches and on-site pedestrian surveys have not identified any archaeological resources within the Project site. The proposed Project would not have the potential to result in an adverse impact to tribal cultural resources.

16.19 UTILITIES AND SERVICE SYSTEMS

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
Would the Project:				
a) Require or result in the construction of new or expanded water, wastewater treatment or stormwater drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

Would the project:

In Chapter 6, *Environmental Effects Found Not to be Significant*, the EIR for the Robert A. Perdue Water Treatment Plant Master Plan described the purpose of the proposed Project was to meet existing and future drinking water regulations. The proposed improvements would increase electrical power usage at the Perdue WTP. However, as described in Section 16.6, *Energy*, according to SDG&E, the increased energy consumption would not require additional primary feed (which is still the case). These increased demands for electrical power are essential to project operations and would not represent excessive or inefficient use of energy. In addition, the hydro-electric turbine, which was installed on an aqueduct and as described in the 2006 EIR, has provided a sustainable source of energy when in operation.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Require or result in the construction of new or expanded water, wastewater treatment or stormwater drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?*** The proposed Project would not require or result in the construction of new or expanded water, wastewater treatment or stormwater drainage, electrical power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. The conclusions from the 2006 EIR still apply to the proposed Project.

b) ***Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?*** The proposed Project would not result in the need for new or expanded water supplies. If anything, the proposed Project Addition would result in improvements to water quality at the reservoir, which is a surface water reservoir used for drinking, after treatment. Therefore, no impacts are anticipated to occur under the proposed Project and the conclusions from the 2006 EIR still apply to the proposed Project.

c) ***Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*** The proposed Project would not require or result in the construction of new wastewater treatment facilities nor would it require the expansion of existing facilities. The proposed Project would not create or contribute runoff that would exceed the capacity of any stormwater drainage systems in the vicinity. The

proposed Project would not generate wastewater and would not exceed the capacity of Robert A. Perdue Water Treatment Plant. In fact, the implementation of the proposed Project Addition would reduce treatment costs at the Perdue WTP and expand the yield from the reservoir. The conclusions from the 2006 EIR still apply to the proposed Project.

d) ***Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?*** The proposed Project would not require or result in the construction of new solid waste facilities, nor would it require the expansion of existing facilities. Therefore, no impacts are anticipated to occur with the proposed Project and the conclusions from the 2006 EIR still apply to the proposed Project.

e) ***Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*** The proposed Project would comply with all applicable federal, state, and local statutes and regulations related to solid waste and diversion from landfills. The conclusions from the 2006 EIR still apply to the proposed Project.

16.20 WILDFIRE

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
If located in or near state responsibility areas or lands classified as a very high fire hazard severity zones, **Would the Project:**				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☒	☐
c) Require the installation or maintenance of associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☒	☐
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

Would the project:

When the EIR for the Robert A. Perdue Water Treatment Plant Master Plan was prepared Wildfire was not one of the resource areas identified in Appendix G of the CEQA Guidelines. The 2006 EIR briefly addressed fire protection services as a part of the Utilities and Public Services analysis.

The potential impacts associated with the modified project implementation are discussed below.

a) ***Substantially impair an adopted emergency response plan or emergency evacuation plan?*** As described in Responses 16.9(f) and 16.17(d), the proposed Project would not conflict with an emergency response plan would not impair or otherwise interfere with

emergency access to local roads. The proposed Project would not result in traffic delays that could substantially increase emergency response times or reduce emergency vehicle access.

b) ***Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?*** The Sweetwater Reservoir area is located outside of the Fire Hazard Severity Zones for both State Responsibility Areas and Local Responsibility Areas (California Department of Forestry and Fire Protection [CAL FIRE] 2020). The proposed Project would not add habitable structures that could be exposed to fire risk. The proposed Project would not change the fire hazard severity zones and long-term use would not impact response times of local fire departments. The proposed Project would have no impacts related to exposing people or structures to a significant risk of loss, injury or death involving wildland fires. The Authority will coordinate with the Fire Authority Having Jurisdiction regarding any needs to comply with the applicable Fire Code. Therefore, no impacts are anticipated to occur.

c) ***Require the installation or maintenance of associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?*** Landside construction associated with the proposed Project Addition would be limited to buried utility lines and two air compressors. The operation of these air compressors would not substantially exacerbate fire risk. Additionally, the air compressors would not be operated continuously, instead they would be intermittently when existing water quality conditions require it. The Authority will coordinate with the Fire Authority Having Jurisdiction regarding any needs to comply with the applicable Fire Code to determine if there is a need for a fuel break, but this is not anticipated given the location of the project facilities (mainly surrounded by developed areas, and other project areas are under the water). Therefore, the potential for wildfire risk would be minimal or non-existing.

d) ***Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?*** As described in Section 16.7, *Geology and Soils* the Project site is not located within a FEMA Special Flood Hazard Area or in area where previously landslides or unstable soils have been identified. Therefore, there would be no impacts associated with downslope or downstream flooding or landslides associated with the proposed Project.

16.21 MANDATORY FINDINGS OF SIGNIFICANCE

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wild-life population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒

	New Potentially Significant Impact	New Mitigation is Required	No New Impact / No Impact	Reduced Impact
b) Does the project have impacts that are individually limited, but cumulatively considerable? (Cumulatively considerable means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☐	☒	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

a) ***Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to decrease below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of major periods of California history or prehistory?*** As discussed in this Addendum to the EIR, the proposed Project would involve the construction of two air compressors near an area that was previously mapped as coastal sage scrub habitat in the EIR for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Activities. Coastal sage scrub habitat in the vicinity of the reservoir supports the federally threatened California gnatcatcher. Removal of coastal sage scrub habitat and indirect construction noise could result in impacts to these listed species. Although it is not expected that the proposed Project Addition construction activities or operational noise would result in an impact to gnatcatchers or coastal sage scrub, the 2006 EIR analyzed the removal of approximately 1.3 acres of coastal sage scrub as well as indirect impacts to the California gnatcatcher and least Bell's vireo due to increased noise, vibration, and dust during construction in the same vicinity of the proposed Project Addition. This impact to coastal sage scrub habitat has already been mitigated through the provision of habitat replacement. In addition, the actual impact for the installation of the compressors will be on an area already disturbed and used for parking boats and storing lake related equipment, and the impact to native vegetation has been reduced to relatively small areas. The proposed Project would not result in any additional impacts or any new areas of habitat removal that have not already been previously identified and/or already mitigated. Further the proposed Project would be required to comply with the pre-construction and construction mitigation measures identified in the 2006 EIR.

In addition, the proposed Project Addition would result in significant water quality improvements at the lake, substantially improving the habitat of fish. Given this, no new impacts, not already analyzed in the 2006 EIR, are expected to occur. The proposed Project would not substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; or reduce the number or restrict the range of an endangered, rare, or threatened species. In addition, the proposed Project would not eliminate important examples of California history.

b) ***Does the project have impacts which are individually limited, but cumulatively considerable? (Cumulatively considerable means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)*** As

discussed in this Addendum, the proposed Project Addition would result in less than significant impacts or no impacts to aesthetics, agriculture and forestry resources, air quality, biological resources, cultural resources, energy, geology and soils, GHG emissions, hazards and hazardous materials, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation, tribal cultural resources, utilities and service systems, and wildfire. None of the impacts associated with the proposed Project would make cumulatively considerable, incremental contributions to significant cumulative negative impacts.

c) ***Does the project have environmental effects which will have substantial adverse effects on human beings, directly or indirectly?***

The proposed Project Addition does not have any negative environmental effects which will have adverse effects on human beings. Implementation of the proposed Project Addition would result in significant benefits to water quality, the general lake ecosystem including fish and birds, and overall drinking water quality as the proposed aeration system would help mitigate algae blooms problems, resulting in higher drinking water quality for the Service Area population.

16. PREPARATION

This Addendum and Supplemental Environmental Checklist Form was prepared by Authority staff with initial assistance by WSP USA, the Authority's on-call environmental consultant at the time of preparation.

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Final

Robert A. Perdue Water Treatment Plant Master Plan

Environmental Impact Report

Notice of Determination

013 681

To:

County Clerk County of San Diego
1600 Pacific Highway, Room 300
San Diego, CA 92101

Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

From:

Sweetwater Authority
100 Lakeview Avenue
Spring Valley, CA 91977

FILED
Gregory J. Smith, Recorder/County Clerk

JUL 28 2006

BY _____ DEPUTY

Subject: Filing of Notice of Determination in Compliance with Section 21108 or 21152 of the Public Resources Code.

Project Title: Robert A Perdue Water Treatment Plant Master Plan for Future Facilities (SWA #BP03-10E)

SCH Number: **2004011048**

Project Location: 100 Lakeview Avenue, Sweetwater Reservoir, Unincorporated Community of Spring Valley, County of San Diego

Project Description: The project is a long-term development plan for modifications to the water treatment facilities required to comply with foreseeable water quality regulations and capacity requirements.

This is to advise that the Board of Directors of Sweetwater Authority has certified the environmental document for the above-described project on July 26, 2006 and has made the following determinations:

1. The project will not have a significant effect on the environment.
2. An EIR was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures were adopted as part of an overall Mitigation Monitoring and Reporting Plan.
4. A statement of overriding considerations was not adopted for this project.
5. Findings were made pursuant to the provisions of CEQA.
6. Location and custodian of the documents that comprise the record of proceedings for the EIR: Troy Murphree, Sweetwater Authority, 100 Lakeview Avenue, Spring Valley, CA 91977. (619)409-6815

7-26-06 _____ Director of Environmental and Governmental Services
Date Signature Title

RECEIVED
AUG 30 2006
SWEETWATER AUTHORITY
WATER QUALITY DEPT.

FILED IN THE OFFICE OF THE COUNTY CLERK
San Diego County on JUL 28 2006
Posted JUL 28 2006 Removed AUG 28 2006
Returned to agency on AUG 28 2006
Deputy _____

FINAL

ENVIRONMENTAL IMPACT REPORT FOR THE ROBERT A. PERDUE WATER TREATMENT PLANT MASTER PLAN FOR FUTURE PLANT FACILITIES

State Clearinghouse Number 2004011048

Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910
(619) 420-1413

July 14, 2006

FINAL
ENVIRONMENTAL IMPACT REPORT FOR THE
ROBERT A. PERDUE WATER TREATMENT PLANT
MASTER PLAN FOR FUTURE PLANT FACILITIES
(SCH 2004011048)

This document, entitled the Final Environmental Impact Report (Final EIR) for the Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Facilities, discusses the environmental issues involved with the proposed project.

After completion of the draft EIR, the Notice of Completion (NOC) and Notice of Availability (NOA) were filed with the State Clearinghouse and San Diego County Clerk, as appropriate, to begin the 45-day public review period (May 10, 2006 through June 23, 2006). Additionally, the NOA was published in the San Diego Union-Tribune on May 10, 2006 and distributed to public agencies, organizations, planning groups, and approximately 400 neighbors. Copies of the draft EIR and appendices were and continue to be available on the Sweetwater Authority website, and hard copies of the documents are available at the Bonita, National City, and Chula Vista libraries. Copies were also provided to the Spring Valley Planning Group, Sweetwater Planning Group, County of San Diego Department of Planning and Land Use, California Department of Fish and Game, U.S. Fish and Wildlife Service, and California Department of Health Services. A public open house to discuss the project and draft EIR was held on June 20, 2006 at the Robert A. Perdue Water Treatment Plant.

During the 45-day public review period, written comments were received from the following public agency:

- California Department of Toxic Substances Control

No other persons, organizations, or agencies provided comments on the document. The letter from California Department of Toxic Substances Control and responses to each of their comments are attached. Correspondence from the Governor's Office of Planning and Research are also attached.

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Sean Walsh
Director

June 26, 2006

Troy Murphree
Sweetwater Authority
100 Lakeview Avenue
Spring Valley, CA 91977

Subject: Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Facilities (SCH# 2004011048)
SCH#: 2004011048

Dear Troy Murphree:

The State Clearinghouse submitted the above named Draft EIR to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on June 22, 2006, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2004011048
Project Title Robert A. Perdue Water Treatment Plant Master Plan for Future Plant Facilities (SCH# 2004011048)
Lead Agency Sweetwater Authority

Type EIR Draft EIR

Description A long-term development plan for water treatment facility modifications required to comply with foreseeable water quality regulations and capacity requirements. The majority of the project will be new structures and piping with a limited amount of rehabilitation of existing facilities. The Phase I improvements would involve installation of a new membrane filtration system (MFS), new pre- and post- filtration chemical feed control facility, new water popelines and drains, and discontintuance of the operation of the existing media filter modules. The Phase II improvements would be installed in separate work phases and include replacement of the existing potable water storage facility, installation of an improved pre-treatment system, construction of solids handling facilities, a hydroturbine facility for electrical power generation, and installation of ultraviolet disinfection.

Lead Agency Contact

Name Troy Murphree
Agency Sweetwater Authority
Phone 619.409.6815 **Fax**
email
Address 100 Lakeview Avenue
City Spring Valley **State** CA **Zip** 91977

Project Location

County San Diego
City
Region
Cross Streets N/A
Parcel No. 585-161-0100
Township 17s **Range** 1w **Section** unsect **Base**

Proximity to:

Highways SR125, SB54
Airports
Railways
Waterways Sweetwater River
Schools Kemptom Elem
Land Use

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Drainage/Absorption; Geologic/Seismic; Noise; Toxic/Hazardous; Vegetation; Water Quality; Wildlife; Landuse; Cumulative Effects

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Reviewing Agencies Resources Agency; Department of Fish and Game, Region 5; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 11; Department of Health Services; State Water Resources Control Board, Clean Water Program; Regional Water Quality Control Board, Region 9; Department of Toxic Substances Control; Native American Heritage Commission

---

Date Received 05/09/2006 **Start of Review** 05/09/2006 **End of Review** 06/22/2006

Note: Blanks in data fields result from insufficient information provided by lead agency.

Department of Toxic Substances Control

Dan Skopec
Acting Secretary
Cal/EPA

Maureen F. Gorsen, Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

May 24, 2006

RECEIVED
JUN 06 2006
STATE CLEARING HOUSE

Clear
6-22-06
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Mr. Troy Murphree
Sweetwater Authority
100 Lakeview Avenue
Spring Valley, California 91977

DRAFT ENVIRONMENTAL IMPACT REPORT (EIR) FOR ROBERT A. PERDUE WATER TREATMENT PLANT MASTER PLAN FOR FUTURE PLANT FACILITIES (SCH# 2004011048)

Dear Mr. Murphree:

The Department of Toxic Substances Control (DTSC) has received your submitted draft Environmental Report (EIR) for the above-mentioned project. The following project description is stated in your document: "A long-term development plan for water treatment facility modifications required to comply with foreseeable water quality regulations and capacity requirements. The majority of the project will be new structures and piping with a limited amount of rehabilitation of existing facilities."

Based on the review of the submitted document, DTSC has comments as follow:

1) The EIR should identify and determine whether current or historic uses in the Project area may have resulted in any release of hazardous wastes/substances.

2) The EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If hazardous materials or wastes were stored at the site, an environmental assessment should be conducted to determine if a release has occurred. If so, further studies should be carried out to delineate the nature and extent of the contamination, and the potential threat to public health and/or the environment should be evaluated. It may be necessary to determine if an expedited response action is required to reduce existing or potential threats to public health or the environment. If no immediate threat exists, the final remedy should be implemented in compliance with state regulations, policies, and laws.

Printed on Recycled Paper

Responses to California Department of Substances Control Comments

1. As stated in Section 2.9 of the Draft EIR, all operations involving the handling, storage, and use of chemicals in the water treatment process at the Perdue Water Treatment Plant are conducted in accordance with the *Operating Procedures for Sweetwater Authority*. In the event of releases or spills, Sweetwater Authority staff follows the procedures detailed in the *Emergency Planning and Response for Sweetwater Authority*. All chemical storage locations within the Perdue Water Treatment Plant are closely monitored, and no residual chemicals are allowed to exist outside of their storage tanks, spill containments, or other storage containers. All bulk chemical storage, containment, and feed equipment currently and historically used at the facility are located some distance away from the construction site. Thus, no hazardous materials associated with chemicals used at the Perdue Water Treatment Plant would be encountered during project construction.

2. Please see reply to comment #1.

3) All environmental investigations, sampling and/or remediation for the site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including Phase I and II investigations, should be summarized in the document. All sampling results in which hazardous substances were found should be clearly summarized in a table.

4) Proper investigation, sampling and remedial actions, if necessary, should be conducted at the site prior to the new development or any construction, and overseen by a regulatory agency.

5) If any property adjacent to the project site is contaminated with hazardous chemicals, and if the proposed project is within 2,000 feet from a contaminated site, except for a gas station, then the proposed development may fall within the "Border Zone of a Contaminated Property." Appropriate precautions should be taken prior to construction if the proposed project is within a "Border Zone Property.

6) If building structures, asphalt or concrete-paved surface areas or other structures are planned to be demolished, an investigation should be conducted for the presence of lead-based paints or products, mercury, and asbestos containing materials (ACMs). If lead-based paints or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations, policies, and laws.

   The draft EIR states: "The Phase I improvements are estimated to be completed by fall 2009 and would involve installation of a new membrane filtration system (MFS), new pre- and post-filtration chemical feed control facility, new water pipelines and drains, and discontinued operation of the existing media filter modules.

7) The project construction may require soil excavation and soil filling in certain areas. Appropriate sampling is required prior to disposal of the excavated soil. If the soil is contaminated, properly dispose of it rather than placing it in another location. Land Disposal Restrictions (LDRs) may be applicable to these soils. Also, if the project proposes to import soil to backfill the areas excavated, proper sampling should be conducted to make sure that the imported soil is free of contamination.

3. Please see reply to comment #1.

4. Please see reply to comment #1.

5. The area adjacent to the Perdue Water Treatment Plant is residential. No commercial or industrial uses are located within 2,000 feet of the project site. No other industrial or commercial uses of the Perdue Water Treatment Plant or the adjacent area have occurred since the facility was constructed in 1961.

6. With the exception a metal storage building and its concrete containment structure described below, no demolition of any existing structures or appurtenances will occur as a result of Phase I of this project. The metal storage building to be removed was constructed after1990 when prohibitions on the use of asbestos and lead-based paint were in effect. A portion of the subject building is used to store small quantities of hazardous materials. As such, the building was constructed within a concrete containment basin to confine potential spills, although no spills have occurred. During Phase II, the 1960s concrete "Clear Well" will be removed. Because this is a Programmatic EIR, Phase II will be further analyzed in subsequent documents, as required. At this time it is not anticipated that any structures containing lead-based paints or products, mercury, or asbestos will be demolished. See comment #7 for further discussion.

7. For reasons stated in comment #1, 5 and 6 above, no contaminated soils are anticipated. The construction contract documents will contain language regarding the process that the contractor must follow if any hazardous materials are encountered during excavation. The contract shall also describe the process by which the contractor must notify the Authority and properly dispose of any hazardous materials in accordance with relevant laws and regulations. At this time Sweetwater Authority has no records of any hazardous materials buried or otherwise located within the project areas.

8) Human health and the environment of sensitive receptors should be protected during the construction or demolition activities. A study of the site, overseen by the appropriate government agency, might have to be conducted to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.

9) If during construction/demolition in the Project area, soil and/or groundwater contamination is suspected, construction/demolition in the area should cease and appropriate health and safety procedures should be implemented. If it is determined that contaminated soil and/or groundwater exist, the EIR should identify how any required investigation and/or remediation will be conducted, and the appropriate government agency to provide regulatory oversight.

   The draft EIR states: "Due to storage, handling, and use of chemicals in the water treatment process, hazardous materials residue may be encountered during excavation and construction activities. If discolored soil or other potential hazardous materials issues are encountered during these activities, site-specific environmental investigation and/or mitigation may be required by regulatory agencies."

10) If the site was and/or is used for agricultural activities, onsite soils may contain pesticide, herbicides and agricultural chemical residue. Proper investigation and remedial actions, if necessary, should be conducted at the site prior to construction of the project.

DTSC provides guidance for cleanup oversight through the Voluntary Cleanup Program (VCP). For additional information on the VCP, please visit DTSC's web site at www.dtsc.ca.gov.

If you have any questions regarding this letter, please contact Mr. Joseph Kaslowski, Project Manager, at (714) 484-5471 or email at jkaslowski@dtsc.ca.gov.

Sincerely,

Greg Holmes
Unit Chief
Southern California Cleanup Operations Branch - Cypress Office

8. Please see reply to comment #1.

9. Please see reply to comment #1.

10. The project site is not now and has not in the past been used for agricultural purposes.

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044

Mr. Guenther W. Moskat, Chief
Planning and Environmental Analysis Section
CEQA Tracking Center
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

CEQA # 1413

DRAFT

ENVIRONMENTAL IMPACT REPORT
FOR THE
ROBERT A. PERDUE WATER TREATMENT PLANT
MASTER PLAN FOR FUTURE PLANT FACILITIES

State Clearinghouse Number 2004011048

Prepared for
Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910
(619) 420-1413

Prepared by
EDAW, Inc.
1420 Kettner Boulevard, Ste. 620
San Diego, CA 92101

Public Review Draft
May 4, 2006

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APPENDICES (under separate cover)

A. Notice of Preparation and Responses
B. Drainage Memorandum
C. Biological Resources Report
D. Cultural Resources Inventory
E. Geotechnical Evaluation

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LIST OF ACRONYMS AND ABBREVIATIONS

AC	asphaltic-concrete
AMSL	above mean sea level
Authority	Sweetwater Authority
B.P.	years before present
BMP	Best Management Practice
CAA	Clean Air Act
CalOSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CDHS	California Department of Health Services
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
Cl_2	gaseous chlorine
ClO_2	chlorine dioxide
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CWA	Clean Water Act
cy	cubic yards
DAF	Dissolved Air Flotation
dB	decibel
dBA	A-weighted decibel
DBP	disinfectant byproduct
EIR	Environmental Impact Report
$FeCl_2$	ferrous chloride
$FeCl_3$	ferric chloride
FESA	Federal Endangered Species Act of 1973
HAA	haloacetic acid
IDLH	immediately dangerous to life and health
IDSE	Initial Distribution System Evaluation
IESWTR	Interim Enhanced Surface Water Treatment Rule
JURMP	Jurisdictional Urban Runoff Management Plan
JWA	Joint Water Agency
$KMnO_4$	potassium permanganate

kW	kilowatt
kWh/AF	kilowatt hours per acre-foot of water
L_{dn}	day-night level
L_{eq}	equivalent sound level
LRAA	location running annual average
LT2ESWT Rule	Long Term 2 Enhanced Surface Water Treatment Rule
MBTA	Migratory Bird Treaty Act
MCL	maximum contaminant level
MFS	Membrane Filtration System
mg	million gallons
mg/L	milligrams per liter
mgd	million gallons per day
MS4s	Municipal Separate Storm Sewer Systems
MSCP	Multiple Species Conservation Program
MWD	Metropolitan Water District
NAAQS	National Ambient Air Quality Standards
NaOCl	sodium hypochlorite
NCCP	Natural Community Conservation Program
NH_3 (aq)	aqueous ammonia
NO_2	nitrogen dioxide
NOI	Notice of Intent
NOP	Notice of Preparation
NOT	Notice of Termination
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
O_3	ozone
OSHA	Occupational Safety and Health Administration
PAC	powdered activated carbon
Pb	lead
Perdue WTP	Robert A. Perdue Water Treatment Plant
PM_{10}	suspended particulate matter
$PM_{2.5}$	fine particulate matter
ppm	parts per million
PPV	peak particle velocity
PWS	public water system
RAA	running annual average
RAQS	Regional Air Quality Strategies

RECON	Regional Environmental Consultants
ROG	reactive organic gas
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SAP	Subarea Plan
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDCWA	San Diego County Water Authority
SDWA	Safe Drinking Water Act
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
Stage 1 Rule	Stage 1 Disinfection Byproducts Rule
Stage 2 Rule	Stage 2 Disinfectants Byproducts Rule
SUSMP	Standard Urban Stormwater Mitigation Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TOC	total organic carbon
TTHM	total trihalomethanes
URDS	Urban Runoff Diversion System
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	Ultraviolet
UWMP	Urban Water Management Plan
VOC	volatile organic compound
°F	degrees Fahrenheit

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SUMMARY

PROJECT DESCRIPTION AND SETTING

Sweetwater Authority's *Master Plan for Future Plant Facilities for the Robert A. Perdue Water Treatment Plant* (Perdue WTP) proposes to upgrade the treatment process to comply with the current and proposed federal and state drinking water regulations. The improvements would occur in two phases. The proposed upgrade would bring the Perdue WTP into compliance with requirements for removal of the byproducts of chemicals used in the water treatment process and the microbial pathogens *Giardia lamblia*, *Legionalla*, and *Cryptosporidium* in treated water. Section 1.5.2 provides detailed information on the regulatory setting in which the project is being undertaken and the drinking water standards that necessitate improvements in the water treatment process at the Perdue WTP.

The Phase I improvements are estimated to be completed by fall 2009 and would involve installation of a new membrane filtration system (MFS), new pre- and post-filtration chemical feed control facility, new water pipelines and drains, and discontinued operation of the existing media filter modules.

The Phase II improvements are anticipated to be installed in separate work phases between 2009 and 2025 and would enable the plant to comply with additionally anticipated water quality regulations and increase the treatment capacity to 42 million gallons per day (mgd). Preliminary plans for these Phase II improvements include replacement of the existing potable water storage facility, installation of an improved pre-treatment system, construction of solids handling facilities, a hydroturbine facility for electrical power generation, and installation of ultraviolet disinfection. Further refinement of these proposed improvements will continue to be made as additional testing, operational experience, and design work are completed.

The project site is located adjacent to the northwesterly corner of the Sweetwater Reservoir, in the southwest portion of San Diego County and in the unincorporated community of Spring Valley. The treatment plant property is located on moderately steep topography that ranges from 230 to 315 feet above mean sea level. Vegetation communities within the site include coastal sage scrub, riparian woodland/scrub, eucalyptus woodland, areas of disturbed or ruderal vegetation, and areas that are actively managed for treatment plant operations.

ENVIRONMENTAL ANALYSIS

This Program Environmental Impact Report (EIR) has been prepared in compliance with the California Environmental Quality Act (CEQA) and the *Sweetwater Authority Local Guidelines for Implementing CEQA* (Sweetwater Authority 2004). The document evaluates the environmental effects of implementation of *The R. A. Perdue Water Treatment Plant, Water Quality Studies* (Montgomery Watson Harza 2003a), *Master Plan for Future Plant Facilities* (Montgomery Watson Harza 2003b), *Sweetwater Authority Robert A. Perdue WTP, Water Quality Improvements Project, Final Preliminary Design Report* (Montgomery Watson Harza 2005).

A Program EIR was determined to be the appropriate environmental document, since it provides for the evaluation of a series of actions that can be characterized as one large project related geographically, and with logical parts in the chain of contemplated actions [*CEQA Guidelines Section 15168 (a)*].

The *Final Preliminary Design Report* (Montgomery Watson Harza 2005) provides general engineering design for phases I and II. Because Phase I is further along in the design process and must be completed sooner to comply with the Interim Enhanced Surface Water Treatment Rule (IESWTR), the environmental analysis for this initial phase has been conducted at the project level, and Phase I can be considered for approval by the Sweetwater Authority Board of Directors based on this document. Phase II is described more generally and, although this EIR evaluates worst-case scenario impacts, additional environmental review may be required in the future.

A Notice of Preparation (NOP) for the Draft Environmental Impact Report for the Robert A. Perdue Water Treatment Plant Master Plan was prepared and sent to the State Clearinghouse in January 2004. Notices were also sent to property owners and residents in neighborhoods adjacent to the project site The NOP and responses are in Appendix A of this EIR. Responses to the NOP included a letter signed by 23 nearby residents or families containing questions regarding potential project impacts and the EIR process. A reply to this letter was sent by Sweetwater Authority staff and is also included in Appendix A. Separate letters from two other nearby residents were also received. In general, neighborhood concerns dealt with noise, air quality/dust, traffic, view obstruction, and odors.

Sweetwater Authority determined that an EIR would clearly be required for the project. As such, an Initial Study was not prepared and the EIR was focused on the potentially significant effects

of the project. Chapter 6 provides a brief explanation of why each of the other effects would not be significant or potentially significant.

The environmental analysis of potentially significant environmental effects in Chapter 2.0 of this EIR evaluates the issues of hydrology and water quality, air quality, noise, land use and planning, aesthetics and visual resources, biological resources, historical and archaeological resources, geology and soils, and hazards and hazardous materials. Table S.1 provides a summary of the results of environmental analysis.

Table S.1
Summary of Results of Environmental Analysis

Environmental Issue	Potential Impacts	Mitigation Measures
Hydrology and Water Quality	Water quality impacts may occur from sediment runoff during construction, runoff from impervious areas and improper storage areas/containers, and accidental release of chemicals.	The Authority shall comply with the following per the General Construction Permit to reduce potential water quality impacts during construction to a less than significant level: 1. Prior to commencement of grading, and to obtain coverage under the SWRCB NPDES General Permit for Construction Activity, the Authority shall submit a Notice of Intent (NOI) to prepare a SWPPP that incorporates all conditions of the Permit. 2. Prior to commencement of grading, the SWPPP shall be completed and shall detail proposed methods to preclude runoff and contaminants from leaving the construction site. The SWPPP will include forms and maps for the documentation of all compliance and non-compliance of construction activities, and shall remain on-site for three years after the RWQCB acceptance of the NOT. 3. The manager for the construction contractor shall be responsible for implementing and maintaining the SWPPP as follows: a. Documentation of BMP implementation, as well as documentation of any changes in the implementation described in the SWPPP. b. Ensuring that appropriate staff and subcontractors receive training in SWPPP compliance, and that training is documented in the SWPPP. c. Maintenance and monitoring of BMPs to ensure that they are working properly until the construction area has been permanently stabilized. 4. The following mitigation, monitoring, and

Environmental Issue	Potential Impacts	Mitigation Measures
		reporting measures will be included in the SWPPP: a. The grading plans shall note the condition requiring a SWPPP and monitoring plan, and the BMPs outlined in the SWPPP shall be incorporated into the grading plan to reduce the amount of pollutants and sediments in construction surface runoff before discharge into Sweetwater Reservoir and Sweetwater River. b. Prior to commencement of grading, and as part of the SWPPP, appropriate contractors will be trained in SWPPP implementation and compliance. All training will be documented and inserted into the SWPPP. c. Prior to commencement of grading and as part of the SWPPP, the Authority shall prepare an erosion control plan for the construction phase. The plan will ensure that all erosion and runoff control measures are in place prior to major grading activities, and that exposed slopes and graded areas are protected throughout construction. BMPs shall include the short-term use of silt fences, gravel bags, fiber rolls, erosion control blankets and/or similar devices. d. All soils to be stockpiled shall be protected from erosion and sediment runoff at all times. Stockpiles shall be protected through the use of gravel bags or similar mechanisms near the base of the piles and covered with secured tarps or tackifiers. 5. Stockpiles, refueling activities, and storage areas of hazardous materials (e.g., fuels, lubricants, solvents, and other potential contaminants) shall be located only at predesignated sites with adequate pollution control, as specified in the construction drawings that will be displayed in the construction trailer as required in the SWPPP. 6. Prior to commencement of grading, and as a part of the SWPPP, the Authority shall prepare a construction spill contingency plan in accordance with County DEH regulations. The plan will detail such issues as the disposition of soil contaminated by spills. The contractor's construction manager shall be responsible for compliance with the plan, which shall be retained on-site and available for inspection throughout construction. 7. Stockpiles, refueling activities, and storage of fuels and other potential contaminants shall be located at designated staging areas, as specified

Environmental Issue	Potential Impacts	Mitigation Measures
		in the construction drawings, and detailed in the spill contingency plan and SWPPP. To reduce post-construction and operational impacts on water quality to below a level of significance, the project design shall: 1. Ensure that the drainage facilities are properly sized and designed to control runoff and that drains are directed to sedimentation basins, swales, mechanical trapping devices, riprap or similar devices to minimize the potential for erosion and sedimentation and to minimize water quality impacts. As an ongoing condition of the plan, the drainage system shall be inspected every four (4) months, and cleaned and maintained as necessary to ensure that the system functions properly. 2. Appropriate post-construction BMPs shall be incorporated in the project design. 3. Exposed slopes shall be revegetated or hydroseeded within 30 days after completion of site grading. 4. Native vegetation shall be preserved wherever feasible for immediate replacement on disturbed areas following grading. Native topsoil shall be stockpiled and reapplied as part of site reclamation. 5. Surface and subsurface drainage shall be designed to preclude ponding outside of areas designated for drainage containment.
Air Quality	Construction of the proposed project would result in impacts to ambient air quality and the temporary generation of emissions of CO, ROG, NO_X, PM_{10}, and $PM_{2.5}$.	Although there would be no significant impact from fugitive dust and particulate emissions, the Authority would incorporate the following measures into the project to minimize the emissions of PM_{10}, and $PM_{2.5}$ and comply with SDAPCD Rule 51: • Minimize land disturbance. • Use watering trucks to minimize dust – watering should be sufficient to confine dust plumes to the project work areas. • Suspend grading and earth moving when wind gusts exceed 25 miles per hour unless the soil is wet enough to prevent dust plumes. • Cover trucks when hauling dirt. • Stabilize the surface of dirt piles if not removed immediately. • Install a gravel bed at the northerly terminus of the dirt access road to prevent dirt track-out onto the paved road. • Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway.

Environmental Issue	Potential Impacts	Mitigation Measures
		• Revegetate disturbed land as soon as feasible. • Remove unused material.
Noise	Neither construction nor operation would result in a violation of the County Noise Ordinance. However, construction noise levels, would impact noise-sensitive species at adjacent habitat or nesting sites.	Construction Impacts No mitigation other than compliance with the County Noise Ordinance is recommended to protect human receptors from construction-related noise. Sensitive Species Receptors Mitigation measures for the potential impacts of increased noise levels during construction are listed in Biological Resources, Section 2.6.4.
Land Use and Planning	Less than significant	Not required
Aesthetics and Visual Resources	Construction staging and storage areas and portions of the MFS basins would be visible from residential areas.	The Authority proposes to implement the following measures to minimize adverse temporary and permanent effects of the proposed Phase I and Phase II projects: 1. Exterior surfaces of proposed structures shall be finished in a manner that is similar to the existing Perdue WTP structures. 2. All existing landscaped areas that are removed for construction staging, storage, parking, or other temporary uses shall be restored to their preexisting or improved landscape condition. 3. Native or non-invasive trees and shrubs shall be installed to reduce the apparent bulk and scale of new structures visible from off-site residential and public open space areas. 4. All new exterior lighting shall be fully shielding so that the light element is not visible from any adjacent residential or public open space areas.
Biological Resources	Direct impacts to 1.3 acres of coastal sage scrub and indirect impacts to the California gnatcatcher and least Bell's vireo, and indirect impacts due to increased noise, vibration, and dust during construction would be considered significant.	Preconstruction Mitigation Measures 1. The project biologist shall consult USFWS in the year immediately prior to construction to determine if updated surveys for Quino checkerspot butterfly are necessary. 2. The project biologist shall ensure compliance with all biological project constraints. Duties shall include reviewing all grading and construction plans prior to commencement of grading or construction, providing a biological resources education program to construction managers and crew prior to any grading or construction, monitoring all phases of grading and construction, and assessing and coordinating any project area adjustments. 3. Temporary exclusionary fencing shall be installed at the project brushing limits and maintained to avoid accidental intrusions into adjoining sensitive habitats. Coastal Sage Scrub Impacts 4. Impacts to coastal sage scrub shall be mitigated

Environmental Issue	Potential Impacts	Mitigation Measures
		through the provision of replacement habitats as shown in Table 2.12. Replacement habitats shall contain similar species, in comparable concentrations, as those found in the project impact areas and shall be located in areas of larger connected open space within the proposed JWA NCCP conservation area. Replaced habitat shall be sited as close as possible to the project impact so as to maintain the overall biological integrity of the area. Replacement habitat shall exhibit characteristics or biological value equal to or greater than the habitat being lost. Replacement habitats shall be set aside within a conservation easement provided through the Sweetwater Authority SAP of the JWA NCCP. Initial oversight of the conservation area will be provided by the Sweetwater Authority biologist. The Implementing Agreement for the Sweetwater Authority SAP will provide the details of the required management of this and other conserved areas. The proposed JWA NCCP conservation easement area includes land within the Authority's Sweetwater Reservoir property, which lies adjacent to the USFWS San Diego National Wildlife Refuge – Otay-Sweetwater Unit. This connectivity to a permanent habitat preserve area provides greater habitat value and a more functional wildlife corridor and habitat linkage than that which would be removed by the project. The proposed JWA NCCP conservation area also provides for the preservation of a large, interconnected block of native habitat which exhibits an ability to support a high density of the California gnatcatcher and other target species. For these reasons, provision of replacement mitigation by the Sweetwater Authority within its proposed JWA NCCP conservation area consistent with the proposed SAP would reduce impacts to coastal sage scrub habitat to a less than significant level. 5. Permanent preservation and management of the replacement habitat shall be assured to the satisfaction of the USFWS and CDFG by adoption of the Sweetwater Authority SAP pursuant to the JWA NCCP. This shall include designation of a conservation easement that is permanently protected by requirements specified in the Implementing Agreement for the Sweetwater Authority SAP. Alternatively, the USFWS and CDFG may authorize permanent preservation through an independent

Environmental Issue	Potential Impacts	Mitigation Measures
		conservation easement granted to a public entity or non-profit corporation under terms satisfactory to USFWS and CDFG, which may include funding through an endowment account for maintenance and management of the conservation easement. 6. In occupied coastal sage scrub, brushing activities shall be conducted between September 1 and February 15 to avoid the California gnatcatcher nesting season. Where least Bell's vireo is determined to be present, removal of vegetation shall occur between October 1 and March 15. 7. Temporarily disturbed areas or manufactured slopes shall be revegetated with appropriate native species, as approved by the project biologist. Species selected will mimic those of the adjoining coastal sage scrub habitat and will be derived from local seed sources. Revegetated areas shall be monitored for a period of five (5) years, and any diseased or dead plants replaced as soon as feasible to ensure habitat success. 8. The placement of 0.02 acre of riprap below the high-water level of the reservoir would not impact wetland vegetation, however, application to the USACE shall be required for coverage under Nationwide Permit 7 for outfall structures and maintenance or Nationwide Permit 13 for bank stabilization. All permit requirements shall be implemented. <u>Mitigation Measures for Temporary Construction Noise Impacts</u> 9. The project shall be evaluated for opportunities to schedule construction activities outside of the breeding season of the California gnatcatcher and least Bell's vireo. Construction shall be scheduled to avoid the breeding season to the maximum extent practicable. 10. Construction noise exceeding 60 dBA Leq shall be minimized or avoided to the maximum extent practicable during the respective bird nesting periods for California gnatcatcher and least Bell's vireo. Possible noise abatement techniques could include, but are not limited to, the use of sound blankets, and/or the installation of noise-reducing mufflers on equipment. For construction at the MFS facility site, sound barriers (e.g., walls) are not recommended in that habitat fragmentation could be more impactive than the noise levels. 11. When construction during the breeding season is unavoidable, an adaptive monitoring program

Environmental Issue	Potential Impacts	Mitigation Measures
		shall be implemented with monitoring performed by a qualified biologist possessing necessary species monitoring permits or otherwise approved by the state and federal wildlife agencies: a) Active California gnatcatcher and least Bell's vireo territories within 500 feet of construction limits shall be identified no less than one month prior to construction activities and monitoring will continue thereafter through the nesting season or cessation of construction activities. b) Territories will be monitored at weekly intervals with a focus on identifying active nests. Any atypical territory displacement, evacuation, or nest failures as compared to a control site or other baseline will be attributed to the construction project, and mitigated as follows: • Subject to review of data and concurrence by the wildlife agencies, a zone of influence shall be delineated using territory mapping and nesting data and acres of indirect impact shall be assessed. Impacts shall be mitigated at a ratio of 0.5:1 within the JWA NCCP conservation area and covered by a permanent conservation easement. • Compensation for these temporary impacts is proposed at a reduced ratio since no physical habitat disturbance will occur and habitat will be available for species recolonization and nesting once construction is complete. <u>Mitigation Measures for Construction Blasting</u> 12. Impacts from blasting due to excessive noise, vibrations, or scattering of blast debris shall be minimized by implementing the following measures: • A blasting test shall be performed outside the breeding season and blasting techniques adjusted to keep noise, vibration, and blast debris at a minimum. • The project biologist shall monitor the blasting test and subsequent blasting activities to determine whether impacts to California gnatcatcher or least Bell's vireo result from the blasting. • If impacts from the blasting activities are noted, the adaptive monitoring requirements of mitigation measure 11, above, shall be

Environmental Issue	Potential Impacts	Mitigation Measures
		implemented. Mitigation Measures for Permanent Indirect Impacts 13. An assessment of ambient noise generated from new treatment plant facilities (e.g., pumps, motors, etc.) shall be conducted to determine if new noise levels will exceed 60 dBA L_{eq} in the adjacent habitat for the California gnatcatcher and least Bell's vireo. If new ambient noise exceeds 60 dBA L_{eq}, noise reduction features shall be implemented to reduce noise below this threshold. If increased ambient noise levels are unavoidable, a zone of permanent indirect impacts shall be calculated and an acceptable mitigation ratio shall be negotiated with the wildlife agencies. Mitigation shall be provided through habitat preservation in the future JWA NCCP conservation area. 14. Any required nighttime lighting shall be shielded and directed away from adjacent habitat areas. 15. Water runoff and sedimentation into adjacent preserve areas shall be prevented through the implementation of BMPs as described in Section 2.1 of this EIR.
Historical and Archaeological Resources	No significant impacts.	In the event that cultural resources are found during construction, work in that area should be temporarily halted, and the find assessed by a qualified archaeologist. If the find is determined to be eligible for the California Register, then a research design and data recovery program should be prepared and carried out to mitigate impacts before ground-disturbing construction activities resume.
Geology and Soils	Less than significant.	Although the proposed project is not anticipated to result in significant impacts to geology and soils, specific recommendations for earthwork activities and project design features include, but are not limited to, the following to ensure that impacts to geology and soils would be less than significant. 1. Site Preparation. The project area shall be cleared and grubbed prior to grading. Clearing and grubbing shall consist of the removal of vegetation, asphaltic concrete, and other deleterious materials. Clearing and grubbing shall extend outside of the proposed excavation areas. The debris generated during clearing and grubbing shall be removed from areas to be graded and disposed of at a predetermined and legal location. 2. Temporary Excavations and Shoring. Trenches and excavations shall be designed and constructed in accordance with appropriate and applicable Occupational Safety and Health

Environmental Issue	Potential Impacts	Mitigation Measures
		Administration (OSHA) regulations. These regulations provide trench sloping and shoring design parameters for trenches up to 20 feet deep based on the soil types encountered on the project site. Trenches over 20 feet deep shall be designed by the contractor's engineer based upon site-specific geotechnical analysis. Soil classifications and excavation activity shall be confirmed in the field by the Geotechnical Consultant in accordance with OSHA regulations. 3. Excavation Characteristics. Based upon the excavation characteristics of the on-site materials, excavation cannot be performed with conventional earthmoving equipment. The metavolcanic rock would require the use of heavy tipping or breakout equipment or blasting.
Hazards and Hazardous Materials	Construction activities may create potential significant impacts to the safety of project workers and the public. The operation of the facilities and the handling and storage of chemicals are anticipated to be less than significant.	The Authority has established specific responsibilities and procedures that minimize the potential for hazardous incidents and provide appropriate response to ensure public safety during construction and operation of the facilities. 1. Construction Measures. Safety for project workers and the public during project construction is governed by California Occupational Safety and Health Administration (CalOSHA) and requires that a "safe construction practices" plan be prepared. For the proposed project, such a plan would address items such as installing barricades around trenches, especially during construction of open trenches too large to cover with trench plates; plans and specifications for proper staging areas, clearly identifying vehicular and pedestrian access routes; and installation of proper signage, cones, fences, and barricades around construction sites, especially during nonconstruction working hours. The project site is completely within the existing Perdue WTP property and is not open to the public; however, ingress and egress of construction equipment and trucks to and from the project site would be restricted to a designated haul route and construction times to ensure the safety of the public. In addition, prior to site development involving soil excavation, grading, or other subsurface disturbance, a contingency plan shall be prepared to address the possibility of encountering localized areas of potential hazardous materials concern. The plan shall address monitoring of excavated soil, community and worker health and safety, and soil handling, stockpiling, characterization, on-

Environmental Issue	Potential Impacts	Mitigation Measures
		site reuse, export, and disposal protocols. Appropriate references to the potential to encounter contaminated soils shall be included in construction specifications. 2. Operation Measures. Sweetwater Authority is subject to standards covering areas such as written process safety information, process hazard analysis and evaluation, operating procedures, training, and emergency planning and response. Sweetwater Authority currently has the appropriate safety protocols in place with the *Emergency Planning and Response for Sweetwater Authority* (Tracer 2004a) and an operations plan with the *Operating Procedures for Sweetwater Authority* (Tracer 2004b) to ensure the safety of its employees and the public. 3. Emergency Planning and Response. Sweetwater Authority and its employees are obligated to report all significant releases or potential releases of hazardous materials. Specific protocols are established to report, evaluate, and identify the extent and details of the releases and the nature of the release to appropriate and designated individuals on the Sweetwater Authority staff and outside assistance personnel. A contact list (names and numbers) and protocol are provided. Evacuation procedures and locations as well as response actions are included in the Emergency Planning and Response plan. A hazardous material incident report form is also included with a list of emergency equipment and the location of the equipment. Emergency training is available and required for Sweetwater Authority personnel. 4. Operating Procedures. Sweetwater Authority shall prepare an updated Operating Procedures plan to reflect the tasks to be performed for the upgraded water treatment facilities being proposed and shall further update the Operating Procedures plan each time that new treatment facilities are installed. The procedures shall outline the data that should be recorded, the safety precautions taken, and the training provided for each operating procedure. The procedures would include delivery, tank change, start-up and shutdown, emergency shutdown and operations, startup following an emergency shutdown, normal operations, and temporary operations.

CHAPTER 1.0
PROJECT LOCATION, DESCRIPTION, AND ENVIRONMENTAL SETTING

1.1 PROJECT LOCATION

Sweetwater Reservoir is located in the southwest portion of San Diego County. The Reservoir and contiguous Sweetwater Authority (Authority) lands encompass approximately 1,823 acres. The Robert A. Perdue Water Treatment Plant (Perdue WTP) is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley. The project site is shown in a regional context in Figure 1.1 and on the U.S. Geological Survey (USGS) National City and Jamul Mountain Quadrangles in Figure 1.2. Figure 1.3 is a local area Vicinity Map that shows access to the project site from State Route 125 via Paradise Valley Road/Jamacha Road, Swap Meet Road, Quarry Road, and Lakeview Avenue.

1.2 BACKGROUND

The Authority is a public agency and water purveyor in the South Bay area of San Diego County serving a total of approximately 177,000 customers in National City, the western portion of Chula Vista, and the unincorporated community of Bonita. Approximately 88 percent of the Authority's water service connections are for residential use, 10.3 percent for commercial and industrial use, and 1.7 percent for governmental and other use. The Authority operates Sweetwater and Loveland reservoirs for water storage, and utilizes Sweetwater River to transfer water from Loveland Reservoir to Sweetwater Reservoir. In addition to water supplied from the 144-square-mile watershed east of Sweetwater Reservoir, the Authority also receives imported water from the Colorado River and northern California via the San Diego County Water Authority (SDCWA) Aqueducts that pass through the Perdue WTP property. Both treated and raw water are available to the Authority via the Aqueducts. Raw imported water may be treated directly or stored in Sweetwater Reservoir for later use. Sources of water identified as "raw" water refer to untreated or insufficiently treated water that must receive additional treatment through filtration and/or addition of chemicals to ensure a safe supply of water for human consumption. Figure 1.4 shows the upstream Sweetwater River watershed and Figure 1.5 shows the Authority's service area.

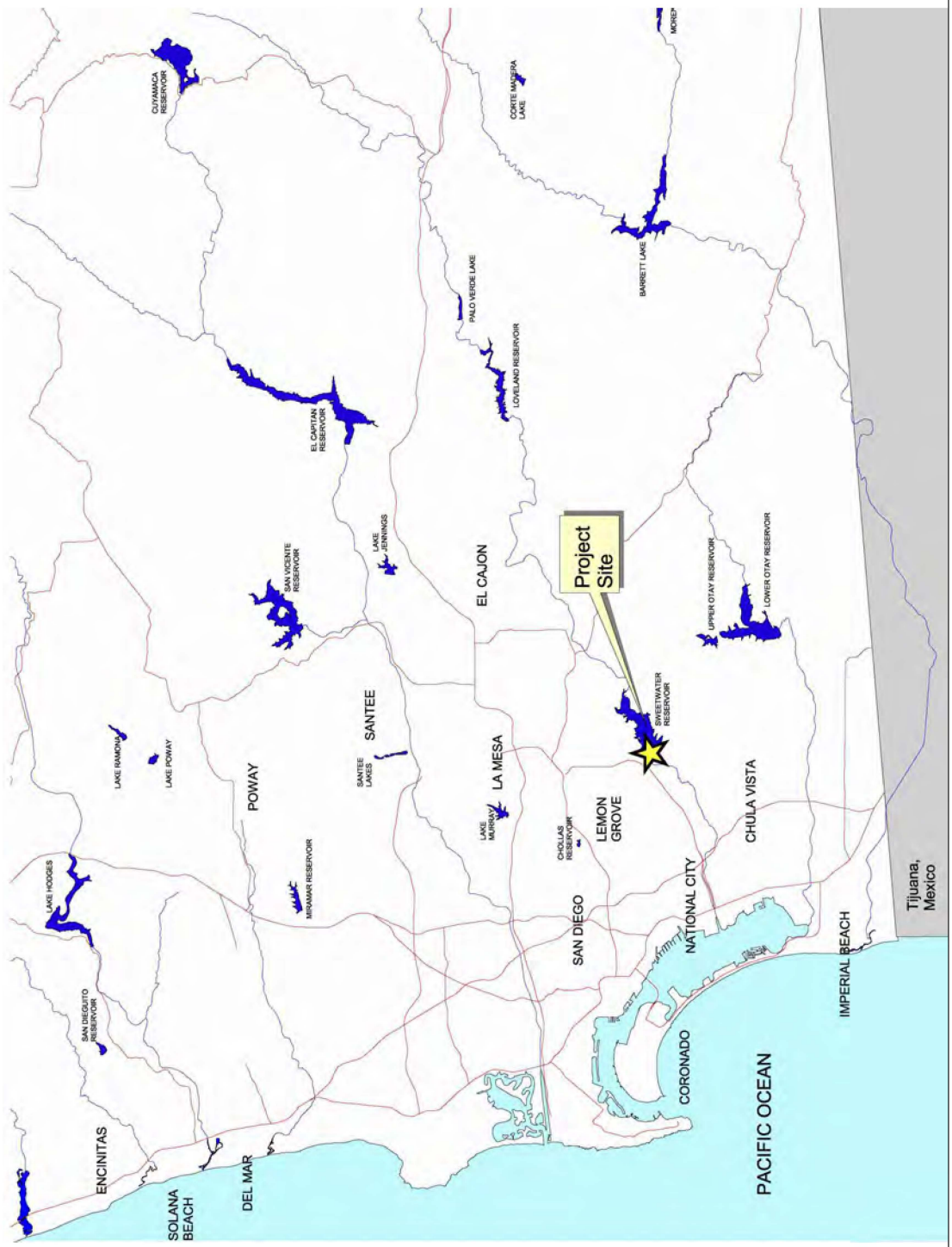

Figure 1.1
Regional Map

Source: Sweetwater Authority 2005

Figure 1.2
USGS Map

P:\2004\4K004 R Perdue WTP MP Sweetwater Authority\5GIS\Mxd\SWA\usgs.mxd sp83Z6f 11/14/05

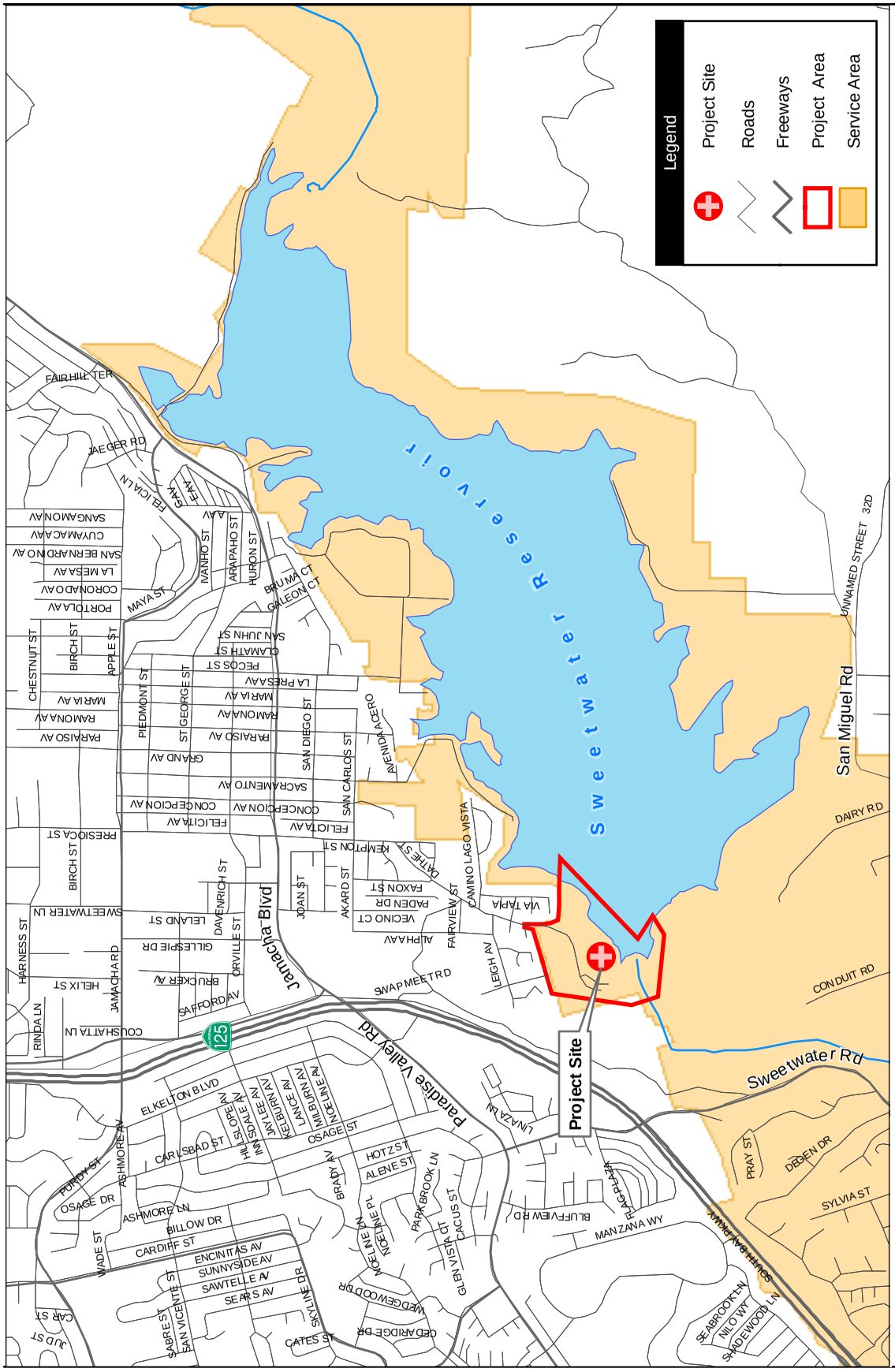

Figure 1.3
Vicinity Map

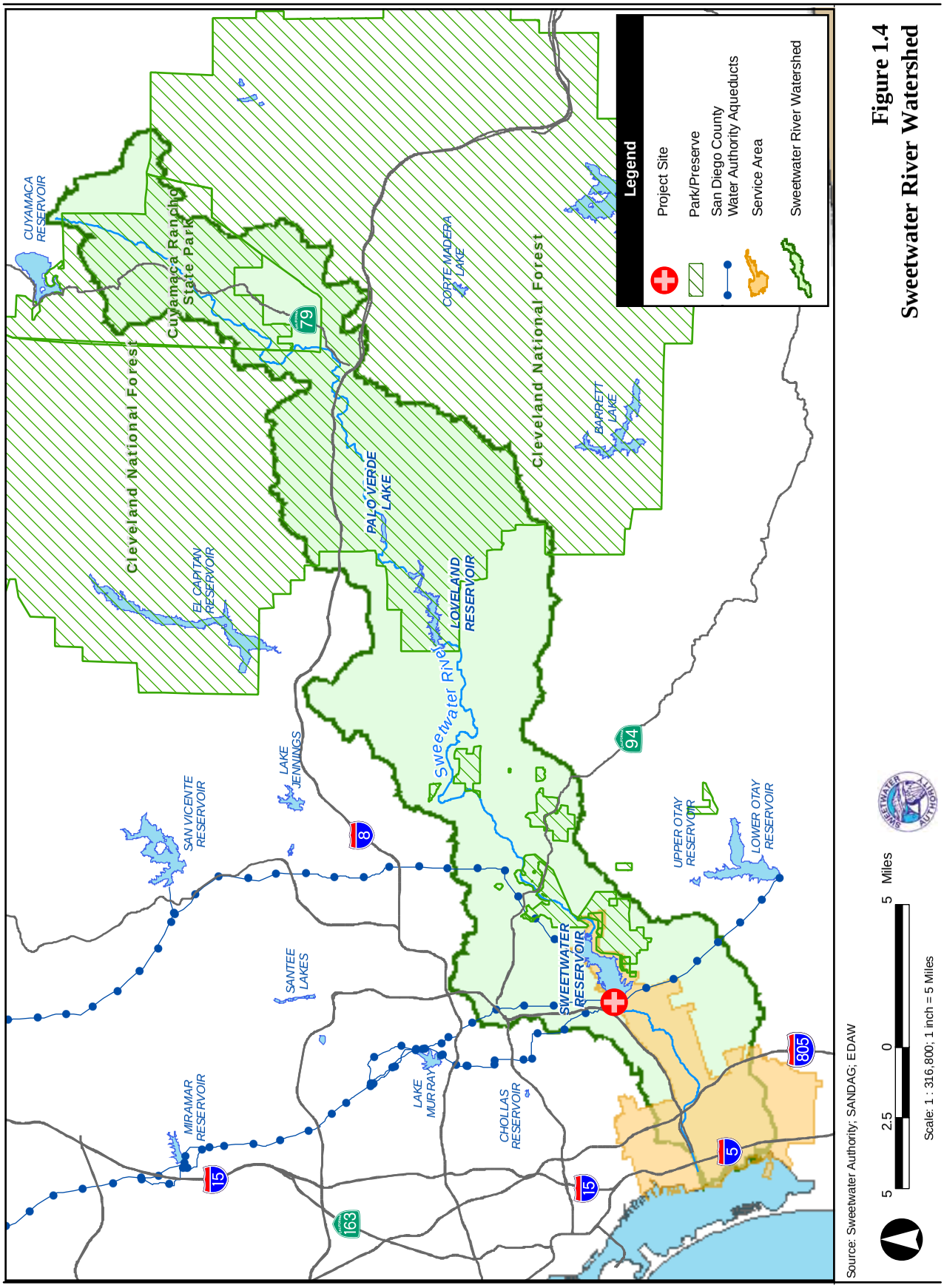

Figure 1.4
Sweetwater River Watershed

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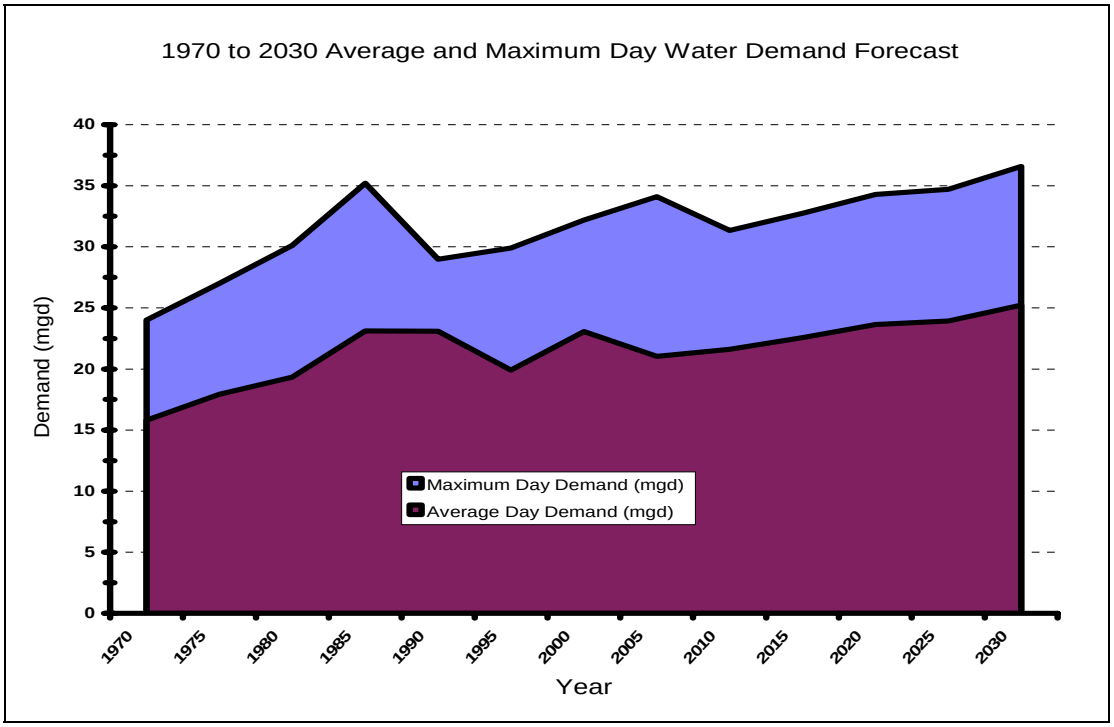
Figure 1.5
Sweetwater Authority Service Area and Water Treatment Facilities

2004\4K004 R Perdue WTP MP Sweetwater Authority\6Graphics\Figures\Fig1.5.fh11 (dbrady) 10/26/05

Total water production by the Authority in 2004 was 25,021.5 acre feet,[1] with approximately 82.4 percent of this total coming from SDCWA and 17.6 percent coming from Sweetwater and Loveland reservoirs, the Reynolds Desalination Facility, and the National City Wells. These water source data from 2004 are not typical when compared to the 20-year period from 1983 through 2003, during which only 51.2 percent of Authority water was imported from SDCWA (Sweetwater 2005a). The Authority also relies more heavily on imported water during the lower-demand winter months and utilizes local water for over 90 percent of the demand during the summer months. This minimizes reliance on imported sources during the period when demand for imported water and the cost of imported water is highest. In 2004, the average and maximum daily water distributed by the Authority was a total of 22.1 and 36 million gallons, respectively, from local (surface water and wells) and imported sources, with the average and maximum daily production at the Perdue WTP of 22 and 36.5 million gallons, respectively.

Figure 1.6 compares the Authority service area's average daily demand and maximum daily demand since 1970 and estimated through 2030, based on past and projected population data.

Figure 1.6
Sweetwater Authority Historic and Projected Service Area Water Production Demands



Source: Sweetwater Authority, 2005a.

[1] An acre-foot is the quantity of water that would cover 1 acre of land to a depth of 1 foot and is equivalent to 325,850 gallons

While the service area is essentially built out and demand has been relatively stable over the past 10 years, several changes in demographic characteristics and anticipated redevelopment, as well as some planned new development projects, require that the Authority plan for increased water demand in the future: Increased demand for new water service is expected to result from development of the Chula Vista Bayfront, revitalization of older residential and commercial areas in Chula Vista and National City, and mixed-use commercial/residential redevelopment of current low-water-use office and retail establishments along each city's main commercial corridors.

Although Figure 1.6 indicates that 2030 anticipated maximum daily demand is approximately 38 mgd, the upgrades will increase the plant capacity to 42 mgd for the following reasons:

1) The existing pumps have the capacity to pump 42 mgd
2) In case of emergency, the Authority would be one of the few, if not only, water districts equipped to provide water supplies to water districts in the southern part of the SDCWA service area.

1.2.1 Plant Development and Operations

The history of water service to the South Bay began in 1869 when the Kimball Brothers Water Company was formed, the first in a succession of privately owned water companies. In 1972, the South Bay Irrigation District and the City of National City created a Joint Powers Agreement to form Sweetwater Authority as a public agency. In August 1977, the Authority began operation of the water system. Sweetwater Reservoir was created in 1888 upon the completion of Sweetwater Dam when the predominant use of water was for citrus irrigation and drinking water quality was not a major concern. As the population of the South Bay area grew and residential development replaced agriculture, the need for a safe and reliable drinking water supply led to construction of the 25 mgd Sweetwater Filtration Plant, which was completed in 1961. In 2004, the average and maximum daily production at the Perdue WTP was 22 and 36.5 mg, respectively.

The original plant was designed as a direct filtration plant that treated local water stored in Sweetwater Reservoir and consisted of four gravity sand filters, a 10 mg treated water storage reservoir (tank), and an operations building. With continued development within the Sweetwater River watershed upstream of Perdue WTP, bacteriological contamination became a concern at Sweetwater Reservoir. In response to new surface water treatment requirements issued by the U.S. Environmental Protection Agency (USEPA), plans for improvement to the filtration plant were initiated.

In 1987, the refurbishment and expansion of the filtration plant were completed. The improved plant was named after Robert A. Perdue, who had been the Superintendent of Water Quality since the inception of public ownership. The improvements included facilities for pretreatment with ferric chloride ($FeCl_3$) and potassium permanganate ($KMnO_4$), gaseous chlorine (Cl_2) disinfection, flocculation and sedimentation basins to remove suspended matter, gravity filter basins, a new main control room, a water quality laboratory, and chemical storage and feed buildings. The Perdue WTP is currently rated for a maximum water treatment flow of 30 mgd. Figure 1.7 is an aerial photograph of the existing plant. Figure 1.8 is a schematic diagram of the current and proposed treatment processes.

In addition to water treatment capacity provided at the Perdue WTP, the Reynolds Desalination Facility and the National City Wells currently have a total combined capacity of 3 to 6 mgd. With the eventual construction of the proposed San Diego Formation Well #6 as a component of the Desalination Facility, the total groundwater production capabilities will increase to nearly 8 mgd.

1.2.2 Water Planning and Conservation Programs

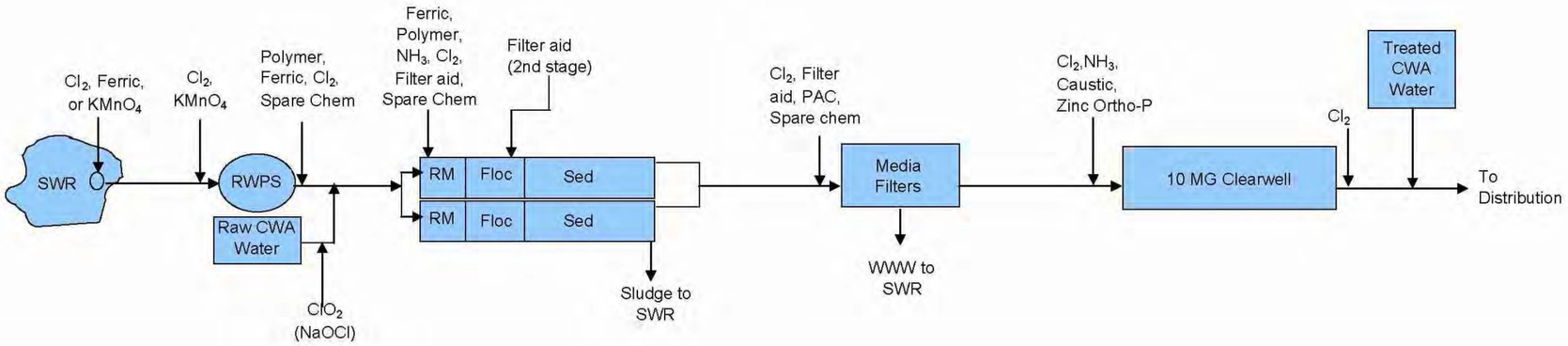
The Authority recognizes water conservation as a priority in its water use planning and a long-term water conservation goal is to achieve and maintain reasonable water use limits for various categories of water users. The Authority has also signed the Memorandum of Understanding Regarding Urban Water Conservation Best Management Practices (BMPs), which commits it to using good faith efforts to implement the BMPs' proven cost-effective water conservation measures, to develop new cost-effective practices, and to initiate these practices as they become feasible. Specific objectives of the Authority's conservation policy include the following:

- Elimination of wasteful practices in water use
- Continued development of information on both current and potential water conservation practices
- Ongoing timely implementation of conservation practices
- Public information and education activities to spread knowledge of water use techniques

In addition, the Authority's conservation program includes the participation in Metropolitan Water District's (MWD) Regional Conservation Programs by creating a xeriscape garden on-site, actively practicing and promoting educational programs for the public, providing turf audits for consumers at no cost, and participating in the annual ultra low flush toilet retrofit program. Sweetwater establishes and enforces guidelines for water use in normal (nondrought)

Figure 1.7
Aerial Photograph of Project Site

CURRENT WTP PROCESS TRAIN NOMINAL FLOW = 30 MGD



LEGEND		
RWPS	=	Raw Water Pump Station
RM	=	Rapid Mix
MFS	=	Membrane Filtration System
PAC	=	Powdered Activated Carbon
SWR	=	Sweetwater Reservoir
T&O	=	Taste and Odor
MPS	=	Membrane Pump Station
WBWW	=	Waste Backwash Water
CWA	=	County Water Authority
Cl_2	=	Gaseous Chlorine
NH_3 (aq)	=	Aqueous Ammonia
NaOCl	=	Sodium Hypochlorite
ClO_2	=	Chlorine Dioxide
$KMnO_4$	=	Potassium Permanganate
$FeCl_2$	=	Ferrous Chloride
$FeCl_3$	=	Ferric Chloride

=Existing Process to Remain

ULTIMATE WTP PROCESS TRAIN NOMINAL FLOW = 42 MGD

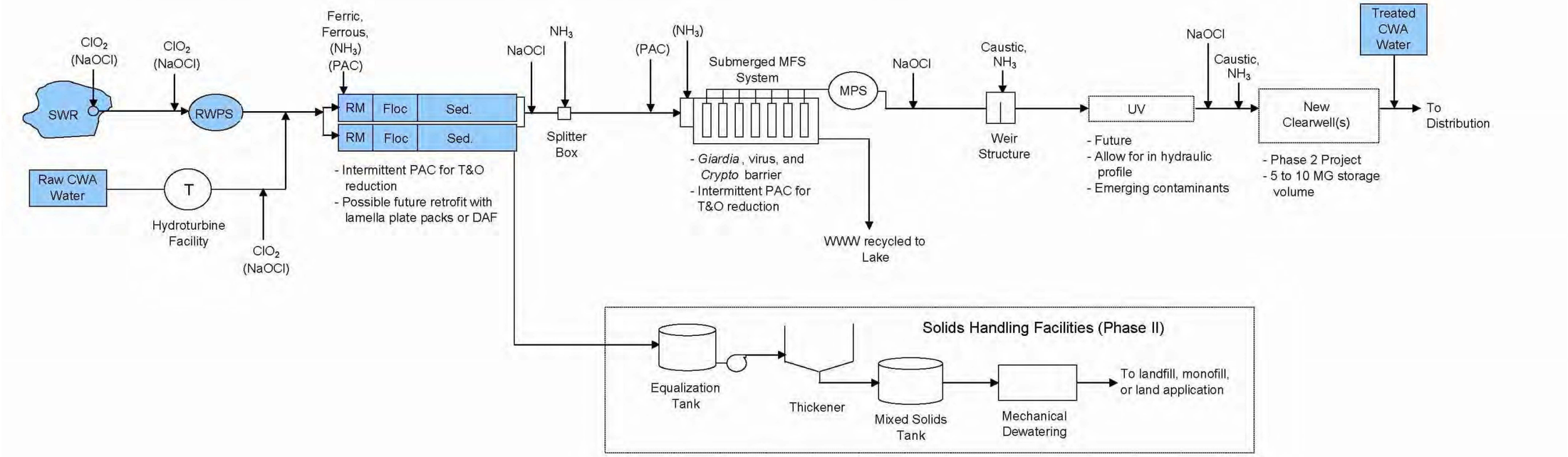


Figure 1.8
Existing and Proposed Treatment Processes

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times. Sweetwater also participates in a voucher program for horizontal axle washers through SDCWA and the MWD, as well as economic and financial incentives with particular water rate structures.

1.2.3 Purpose and Need for the Proposed Project

The objective of the proposed project is to comply with the current and proposed, federal and state drinking water regulations for removal of harmful microorganisms and other potential contaminants from water sources prior to delivery. Additionally, the project would improve and expand the Perdue WTP facilities to provide an adequate supply and quality of treated water to meet the demands of the Authority's customers. Inherent in this statement of purpose is the goal of maximizing opportunities to utilize local surface water sources from Authority reservoirs, and reducing the need to use water imported by SDCWA as a source of raw or treated water.

The Perdue WTP *Master Plan for Future Plant Facilities* (Montgomery Watson Harza 2003b) proposes to upgrade treatment capacity to 42 mgd, to match existing raw water pump station capacity and to enable the Authority to meet future demand using local water resources to the maximum extent feasible, rather than relying on SDCWA sources. As stated above, the Perdue WTP is rated for a maximum water treatment flow of 30 mgd. However, plant operations must be capable of meeting not only the typical daily demand, but also the maximum daily demand, and also must be capable of meeting population growth that is forecast for its service area.

In preparing the Authority's 2005 Urban Water Master Plan (Sweetwater Authority 2005a), population growth data for its service area was obtained from SANDAG's 2030 Regional Growth Forecast, which projects a 198,752 population in 2030. Since the SANDAG forecasts were completed prior to adoption of updated general plans and redevelopment plans for National City and Chula Vista, the Authority reevaluated the SANDAG projections to better reflect more recent plans for mixed-use urban infill projects and the increased water demands they will generate. Phased improvements to the plant's treatment capacity would enable the 42 mgd treatment capacity to be reached by year 2030, when the population within the Authority's service area is projected to be 236,730. This growth projection is based on evolving land use patterns in its service area that are expected to significantly increase the residential population in older areas of National City and Chula Vista that are now comparatively low-water-use commercial and retail businesses (Sweetwater Authority 2005a).

The proposed upgrade to the plant's treatment process would bring the Perdue WTP into compliance with requirements of USEPA for removal of the byproducts of disinfection

chemicals used in the water treatment process and comply with maximum contaminant levels (MCLs) set by USEPA for the microbial pathogens *Giardia lamblia, Legionalla,* and *Cryptosporidium* in treated water. Section 1.5.2 of this Program EIR provides detailed information on the regulatory setting in which the project is being undertaken and the drinking water standards that necessitate improvements in the water treatment process at the Perdue WTP.

The proposed project, as well as other projects undertaken by the Authority, must be accomplished in a manner that most efficiently delivers an adequate supply and quality of treated water consistent with the financial resources of the Authority and its customers; and must be accomplished with a minimum of impact on the natural resources of Authority property and adjacent private and public lands.

1.3 PROJECT DESCRIPTION

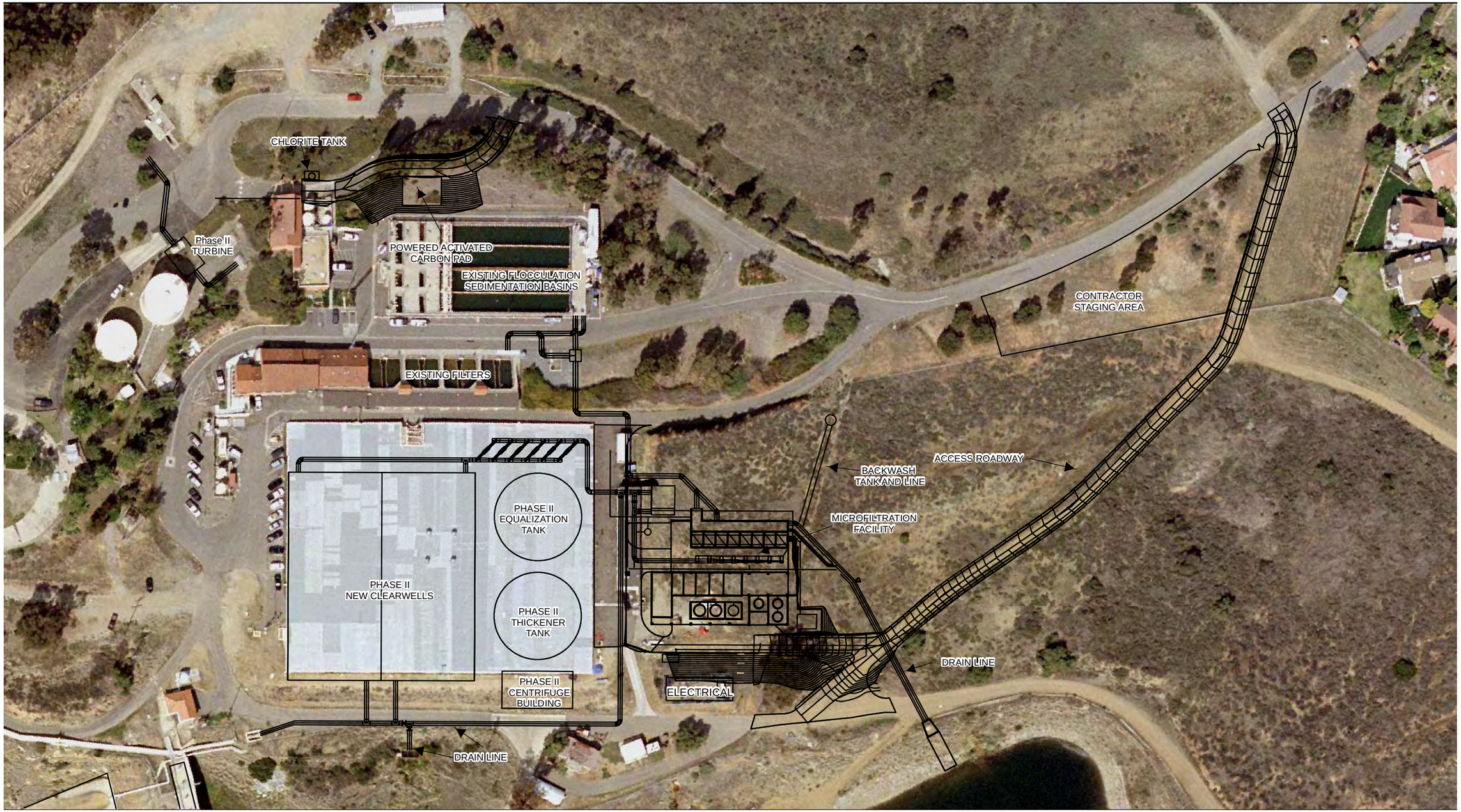
The upgrades planned for the Perdue WTP are intended to ensure that the Authority can continue to meet the future water quality regulations, and provide safe and reliable drinking water. The upgrades proposed for the plant would provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability.

1.3.1 Proposed Phase I Improvements

The proposed Phase I improvements would be installed as a single improvement project scheduled to be completed by fall 2009. These improvements would comply with the USEPA regulations that are anticipated to have an approximate 2012 deadline for compliance. The Phase I improvements would involve the following activities:

- Installation of new membrane filtration system
- Installation of new pre- and post-filtration chemical treatments
- Installation of water pipelines and drains for the new treatment processes
- Installation of a sewer lift station and force main
- Discontinued use of the existing media filter modules

The proposed treatment process in comparison to the existing process is shown in Figure 1.8. A site plan of the facilities is provided in Figure 1.9. More detailed discussion of the proposed Phase I improvements is provided below.



Source: Montgomery Watson Harza

120 60 0 120 Feet

Scale: 1:1200; 1 inch = 100 feet

Figure 1.9
Proposed Treatment Plant Improvements

Path: P:\2004\4K004 R Perdue WTP MP Sweetwater Authority\5GIS\Mxd\Proposed Treatment Plan Improv.mxd, 05/04/06, marraccinib

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Membrane Facilities

The proposed MFS facility would receive water from the existing flocculation/sedimentation basins and would be located in reinforced concrete filtration basins similar to the plant's existing media filter basins. The proposed MFS technology utilizes a low-pressure-driven process that draws water under vacuum through membranes with extremely small openings. The MFS process removes sand, silt, clays, *Giardia lamblia* and *Cryptosporidium*, algae, and some bacterial species. However, the filtered water would require further chemical disinfection as required by federal and state water quality regulations.

Pre- and Post-Filtration Chemical Treatments

The Perdue WTP treatment process utilizes various chemicals and other additives to ensure a safe and high-quality drinking water supply. The plant's current disinfection strategy involves injection of free chlorine at the intake tower, free chlorine contact time through the raw water pump station, and the addition of ammonia prior to the flocculation/sedimentation process. Based on the available monitoring results for residual disinfectant byproducts (DBPs) at the end of the chlorine treatment process, the Authority has determined that it would not be possible for the existing system to comply with the USEPA public water system regulations described in Section 1.5.2. This determination and an analysis of the plant's hydraulic system have resulted in the proposal to install the MFS. Chlorine dioxide would replace gaseous chlorine as a disinfectant during the raw water intake step in the treatment process.

Additives are inserted into the water at various stages in the treatment process train. Figure 1.8 illustrates the current treatment process train and the proposed ultimate process train. The current disinfectant process relies on chlorine-based chemicals and includes gaseous chlorine, sodium hypochlorite, chlorine dioxide; others, such as aqueous ammonia, aid in the effectiveness of the disinfection process but are not themselves disinfectants. As shown in the process train diagrams, these disinfectants and other additives may be used at alternative locations in the treatment process or be used intermittently, or in place of other additives, based on daily water sample testing conducted at the Perdue WTP.

An adequate supply of each of the chlorine-based additives must be maintained at the treatment plant and are delivered, stored, handled, and used in accordance with manufacturers' specifications and the Authority's Operating Procedures (Tracer 2005). Chlorine is considered an acutely hazardous material and its use is closely regulated in compliance with the California Health and Safety Code (Sections 25500 to 25520).

Chlorine treatment also creates unhealthful byproducts, as described below in Section 1.5.2. The proposed MFS would substantially reduce the use of chlorine as a disinfectant within the Ultimate WTP Process Train, which would only add chlorine dioxide during the raw water intake process. Sodium hypochlorite would continue to be used but is considered a less hazardous chemical. It is typically used in the water treatment process at a 12 percent solution, which compares to the 3 to 6 percent solution of sodium hypochlorite in household bleach.

Other additives shown in Figure 1.8 include caustic soda solution (sodium hydroxide), which is used to control acidity in the water, and powdered activated carbon (PAC), which are used to improve taste and odor. All chemical storage would be either within the existing chemical storage facilities, within the new PAC and chlorite storage areas shown in Figure 1.8, or within the new MFS building shown in Figure 1.9.

Installation of Water Pipelines and Drains

The project would include installation of new water pipelines within the plant site to deliver water to each step in the treatment process train and to handle discharge to the Sweetwater Reservoir of waste wash water from the filters and overflow spill water from the treatment process. A proposed 6,000-gallon water storage tank to backwash the membranes is shown in Figure 1.9. A 24-inch gravity pipeline will deliver water to the MFS. A 20-foot-wide construction corridor for the pipeline will be revegetated with coastal sage scrub when construction is completed.

Installation of a Sewer Lift Station and Force Main

A sewer lift station and force main would be installed within the plant site. The sewer lift station would be situated next to the MFS building and an 8-inch force main would be located south of the MFS building following the existing road that leads from the plant to Lakeview Avenue. The force main would connect with the existing Spring Valley Sanitation District sewer system.

Discontinue Use of the Existing Media Filters

The proposed MFS would replace the existing media filter system. Use of the existing filter basins would be discontinued. Redevelopment of this area may be done in the future for plant maintenance, equipment storage, administrative/laboratory offices, or a combination thereof.

1.3.2 Proposed Phase II Improvements

The proposed Phase II improvements are anticipated to be installed in separate work phases between 2009 and 2025. Further refinement of these proposed improvements would continue to be made as additional testing and design work are completed.

- Replacement of the existing 10 mg potable water storage facility
- Installation of improved pretreatment system
- Installation of solids handling facilities
- Hydroturbine facility for electrical power generation
- Installation of ultraviolet (UV) disinfection

More detailed discussion about each feature of the Phase II Improvements is provided below.

Replacement of the Existing Potable Water Storage Facility

The existing 10 mg clearwell is used to store treated ("finished") water at the end of the process. From the clearwell the finished water is piped to the distribution system. The clearwell was constructed in 1960 and is near the end of its structural lifespan. New clearwells with a total capacity of 5 to 10 mg would be constructed on a portion of the existing clearwell footprint as shown in Figure 1.9.

Installation of Improved Pretreatment System

Improvements to the pretreatment process (flocculation/sedimentation) may include a Dissolved Air Flotation (DAF) system. DAF is a system that generates extremely small air bubbles to capture solids that are present in the treatment plant's raw water sources and float them to the surface of the basin to enable them to be skimmed off. DAF also aids in the reduction of total organic carbon (TOC), which can be present in excessive concentrations within the plant's surface water sources. An alternative solids removal process involves installation of "plate packs," which are inclined stainless steel plates that force solids to the bottom of the basin.

Solids Handling Facilities

Solids are the residual elements that are extracted from the water during the flocculation/sedimentation and filtration processes. The Perdue WTP currently disposes of these solids back into the reservoirs, as is the case with most water treatment operations. Should

regulatory requirements require the Authority to discontinue this method of solids disposal, removal of solids from the treatment process would need to be implemented. To reduce the volume of solids prior to removal from the Perdue WTP, they would be put through a thickening and dewatering process as shown in Figure 1.8. The solids handling facilities are also planned to be located within the footprint of the existing 10 mg clearwell as shown in Figure 1.9.

Hydroturbine Facility for Electrical Power Generation

A water pressure reducing station is located at the SDCWA water intake. The Authority has evaluated the potential to install a turbine to generate a maximum of 400 kilowatts (kW) of electricity from this high-pressure flow of water to the plant. This would offset a portion of the estimated 112 kW per hour per million gallons of water that is needed to operate the membrane facility. The locations of the proposed new turbine building and pipeline are shown in Figure 1.9.

Installation of Ultraviolet Disinfection

UV light can be used to disinfect drinking water, though it is not currently in common use in the United States. Its primary additional benefit at the Perdue WTP would be to achieve an even higher level of removal of *Giardia lamblia* and *Cryptosporidium*, which could be required by USEPA in the future. The cost of electricity to power the UV reactors would be an important consideration in any future decision on whether to install a UV system (Figure 1.9).

1.3.3 Site Preparation and Project Initiation

Figure 1.9 shows the locations of proposed Phase I improvements. This overall Perdue WTP area consists of approximately 70 acres, most of which is within the existing footprint of developed plant facilities, paved areas, or other portions of the site that are used for plant operations. The proposed MFS facility would be partially located in an area of coastal sage scrub as shown on Figure 1.10. To avoid seasonal biological impacts to nesting or foraging birds, the existing unimproved or landscaped areas would be cleared of vegetation between September 1 and February 15. Because of the narrow window of time available and the uncertainty of a specific date for commencing work, clearing is desired in advance by a separate construction contract. This would occur between September 2006 and February 2007, while the main Phase I work would still be in design. Therefore, construction of the MFS portion of the Phase I project would proceed without further impact to sensitive biological habitat.

Figure 1.10
Existing Vegetation Communities

P:\2004\4K004 R Perdue WTP MP Sweetwater Authority\5GIS\Mxd\SWA\Fig 1.11 Existing Vegetation Communities.mxd sp83Z6f 10/25/05

Debris generated during clearing and grubbing of the site would be removed from the project site and disposed of off-site at a legal dumpsite. Prior to commencement of clearing and grading operations, the Authority will comply with the State Water Resources Control Board (SWRCB) Statewide General Construction Permit as discussed under Regulatory Setting in Section 1.5.2.

The existing metal "Butler Building" and other improvements located within the proposed project footprint (Figure 1.9) would be removed. This would involve the demolition and removal of approximately 20 cubic yards (cy) of the Butler Building's concrete base (McClelland 2006a). The construction staging area shown in Figure 1.9 would be fenced, a portable building for a contractor's office would be installed, and other facilities necessary for maintenance of construction equipment would be brought onto the site. All construction materials, equipment, and ancillary facilities would be stored within the construction staging area or at the construction site. All contractor vehicles and personal vehicles of construction workers employed at the site would be parked within the treatment plant site in areas identified as existing facilities or actively managed areas as shown in Figure 1.10.

Upon completion of site preparation, grading of the proposed MFS site would begin. Based on the Geotechnical Evaluation prepared by Ninyo & Moore (2005) (see Appendix E), it is anticipated that the upper 4 to 9 feet below the ground surface at the membrane facility site could be excavated with a bulldozer. The maximum required depth of excavation is estimated to be approximately 9 feet, though rock unable to be removed by a bulldozer may be encountered at a lesser depth, in which case, drilling the subsurface rock and blasting would be needed to dislodge the rock for excavation. Approximately 19,000 cubic yards (cy) of excavated material would be removed from the construction site. In the past, excavated material has been stockpiled in existing disturbed areas within the Sweetwater Reservoir site, where it is stabilized and contained to prevent wind and rain erosion, and allowed to revegetate through natural processes. This practice may be implemented for this project due to cost savings in comparison to disposal off-site. Alternatively, all or a portion of the excavated material may be removed from the site by 16-cy-capacity haul trucks, which would involve as many as 1,200 roundtrips. Material transported off-site would be disposed of at an approved landfill.

Operation of construction equipment during site preparation would normally occur between the hours of 7 a.m. and 7 p.m. on Monday through Saturday and comply with the 75-decibel (dB) average sound level measured at the property line of any adjacent residentially developed property in accordance with Section 36.410 of the County Code of Regulatory Ordinances. However, it may be necessary for some deliveries to arrive before 7 a.m. and after 7 p.m.

1.3.4 Construction of Phase I Membrane Filtration System

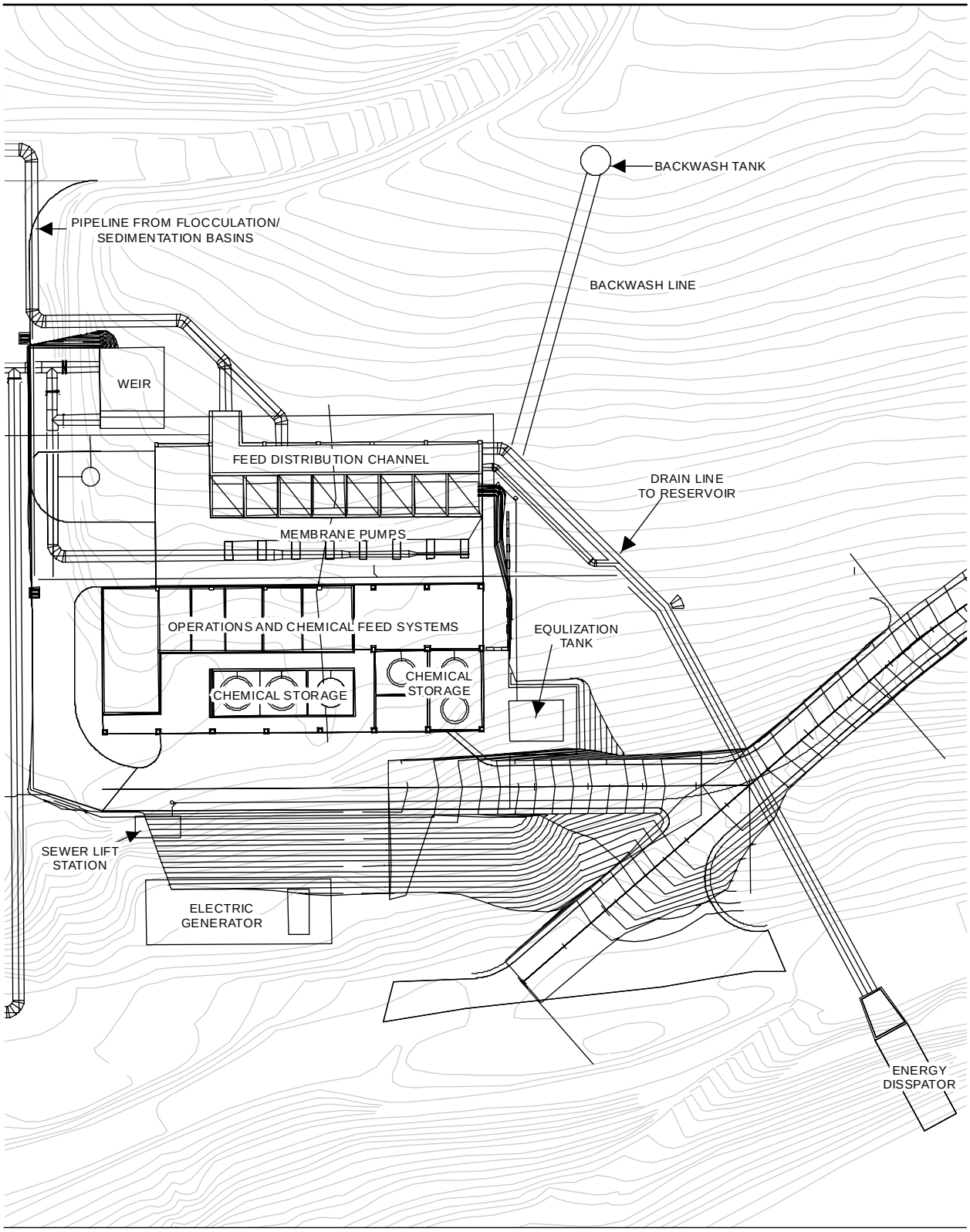
The proposed Phase I MFS would involve construction of poured-in-place reinforced-concrete basins similar in appearance to the existing media filtration basins. The basins and associated operational facilities are shown in Figure 1.11. In addition to the basins, the membrane facility would include water pumps, an operations office and restrooms, chemical storage facilities, and electrical and air compression facilities.

The basins would be constructed within the excavated area as vertical, reinforced, poured-in-place concrete walls that would be up to approximately 15 feet in height and serve to retain the vertically excavated slope on the north and east sides of the construction site, thus minimizing the height of the basins above the natural grade and their visibility from off-site areas. A drainage system would be installed in the space between the excavated slope and the basin walls and the excavated area would be backfilled in accordance with the recommendations of the geotechnical consultant. Permanently backfilled, but undeveloped, areas would be revegetated with native plants consistent with plant materials in the adjacent coastal sage scrub area. A roofed shelter, with a simulated red tile roof similar to other buildings at the plant, would be constructed to a height of approximately 15 feet above the basins and would be enclosed on the south side to contain the operations and storage areas shown in Figure 1.11.

Construction of the membrane facility would generally occur between the hours of 7 a.m. and 7 p.m. on Monday through Saturday and comply with the 75-decibel average sound level measured at the property line of any adjacent residentially developed property in accordance with Section 36.410 of the County Code of Regulatory Ordinances. Occasionally, work will occur between 7 p.m. and 7 a.m. due to conflicts between construction and plant operations, which could require the plant to be shut down. Shutdowns at night, when water demands are lower than during the daytime hours, would minimize impacts of treated water delivery into the entire water system.

1.3.5 Construction of Phase I Ancillary Facilities

Trenching would also be conducted for installation of the various water treatment and drainage pipelines shown in Figure 1.9, including the MFS backwash line and a new outlet into the Reservoir for wash water from the membrane basins. If permanent operational access to areas impacted by pipeline construction is not required, these areas would be backfilled and revegetated with native plants consistent with plant materials in the adjacent area, or mitigated as described in Section 2.6, Biology Resources. The existing graded road that provides access to



Source: Montgomery Watson Harza

50 25 0 50 Feet

Scale: 1: 660, 1 inch = 55 feet

Figure 1.11
Detail of Proposed
Treatment Plant Improvements

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the membrane basin site would be paved to an approximate width of 24 feet with asphaltic-concrete (AC) curbs along both sides.

Other elements of the Phase I project would involve minor modification or removal of existing facilities and would occur within the existing developed area of the site. Upon completion of the Phase I project, temporary improvements installed for the construction staging area would be removed and the area would be re-landscaped with the same or similar ornamental landscape materials that currently exist at that location.

1.3.6 Construction of Phase II Facilities

No specific site development plans for the Phase II facilities have been prepared and the scope of future construction projects is not known at this time. Replacement of the clearwell would involve demolition of some reinforced-concrete elements within the existing clearwell basin. The DAF system would be installed within the existing flocculation/sedimentation basins and would involve relatively minor construction activity. The future solids handling facility and UV system would both be substantial construction projects. Though they are presented in this EIR as possible future projects, no precise information on their location, design, construction requirements, or schedule for construction is known at this time. The hydroturbine project location is shown in Figure 1.9. It would involve improvements within the existing actively managed area of the Perdue WTP and would require relatively minor construction of new structures for the new water turnout building similar to the existing pressure-reducing building, a turbine building that would be approximately 1,000 square feet in size, and trenching for installation of new 24-inch and 36-inch pipelines.

1.4 INTENDED USES OF THIS EIR

This EIR is intended to be used by the Authority as the lead agency and decision-making body considering project approval. Additionally, the document will be used by responsible agencies in evaluating their respective decisions. Local, state, and federal agencies and their roles in reviewing various elements of the project are listed in Section 1.5.2. The document has been prepared in compliance with California Environmental Quality Act (CEQA) and *Sweetwater Authority Local Guidelines for Implementing CEQA* (Sweetwater Authority 2004). The Authority has prepared this EIR as a Program EIR to address a series of actions that can be characterized as one large project related geographically and with logical parts in the chain of contemplated actions *[CEQA Guidelines Section 15168 (a)]*, as further described in the Section 15168 discussion section:

The program EIR enables the agency to examine the overall effects of the proposed course of action and to take steps to avoid unnecessary adverse environmental effects. Use of the program EIR also enables the Lead Agency to characterize the overall program as the project being approved at that time. Following this approach when individual activities within the program are proposed, the agency would be required to examine the individual activities to determine whether their effects were fully analyzed in the program EIR. If the activities would have no effects beyond those analyzed in the program EIR, the agency could assert that the activities are merely part of the program, which had been approved earlier, and no further CEQA compliance would be required. This approach offers many possibilities for agencies to reduce their costs of CEQA compliance and still achieve high levels of environmental protection.

1.5 PROJECT SETTING

1.5.1 Environmental Setting

The project area is at the juncture of the coastal plains and foothills in southwestern San Diego County, with a climate characterized as semiarid steppe. Average annual temperatures range from 40 to 80 degrees Fahrenheit (°F) with annual rainfall averaging just above 10 inches. Rolling topography ranges from 230 to 315 feet above mean sea level (AMSL) within the project site. East of the site is San Miguel Mountain with an elevation of 2,565 feet AMSL. As shown in Figure 1.10, vegetation communities within the project site include coastal sage scrub, riparian woodland/scrub, eucalyptus woodland, areas of disturbed or ruderal vegetation, and areas that are actively managed for treatment plant operations. The site is within the southwestern San Diego County Multiple Species Conservation Program (MSCP) preserve system. Adjacent to the project site are single-family residential areas to the north, natural areas associated with Spring Valley Creek and Sweetwater River to the west, and the Sweetwater Reservoir and natural areas within Authority lands to the south and east.

Within the Perdue WTP site, many relatively undeveloped areas of the property drain naturally to Spring Valley Creek or Sweetwater River downstream of Sweetwater Dam. In developed areas of the site, runoff flows through vegetated drainage swales, concrete surface drains, and a few subsurface storm drains. Water from surface and subsurface systems is collected at inlets west of the clearwell and ultimately released downstream of the Dam. Occasionally, small amounts of water will overflow from plant operations; this water is collected at surface drains and piped to an outlet into the Reservoir located south of the clearwell.

Along the north side of the Reservoir and continuing approximately 5 miles upstream, is the Authority's Urban Runoff Diversion System (URDS). URDS provides collection of hazardous spills, first flush storm flows, and poor quality low flows of urban runoff, which are captured and transported around the Reservoir through a series of ponds, flumes, pipelines, and pump stations. Runoff from hazardous spills are removed by vacuum truck and disposed in a facility permitted to receive hazardous waste. Runoff that is high in total dissolved solids from first flush and dry season low flows of urban runoff, is diverted through the URDS facilities and released downstream of Sweetwater Dam. Higher volume stormwater flows are typically suitable for release into the Reservoir. Settlement of suspended solids and uptake of nutrients is provided in the ponds' manufactured wetlands. As such, URDS reduces urban pollutants entering surface waters of the Reservoir as well as Sweetwater River. First flush and dry season low flows of runoff from the proposed project road will be directed into URDS.

1.5.2 Regulatory Setting

U.S. Environmental Protection Agency – Safe Drinking Water Act

Stage 1 Disinfectants Byproducts Rule and Interim Enhanced Surface Water Treatment Rule (Federal Register: December 16, 1998)

The 1996 amendments to the federal Safe Drinking Water Act (SDWA) (Title XIV of the Public Health Service Act) led to adoption by USEPA of two sets of regulations for public water systems (PWSs): the 1998 Stage 1 Disinfection Byproducts Rule (Stage 1 Rule) for PWSs that treat their water with a chemical disinfectant for primary or residual treatment, and the 1998 IESWTR for PWSs that are substantially reliant on surface water and serve 10,000 or more persons. Because the Authority relies heavily on water collected from within the Sweetwater River watershed (see Figure 1.4) and stored in the Loveland and Sweetwater reservoirs, these rules would have a significant influence on the operation of the Perdue WTP and its water treatment process for removing harmful microorganisms from its raw water sources prior to distribution to its customers.

The Stage 1 Rule is the first of a staged set of rules designed to reduce the allowable limits of DBPs in drinking water, particularly total trihalomethanes (TTHM) and five haloacetic acids (HAAs). The rule establishes MCLs, maximum residual disinfectant levels, treatment techniques, and monitoring requirements to reduce DBP exposure. Under the Stage 1 Rule, the Perdue WTP must maintain MCLs of 0.080 milligrams per liter (mg/L) and 0.060 mg/L for TTHM and HAAs, respectively.

The IESWTR extends from the 1989 Surface Water Treatment Rule in which USEPA set MCL goals for the microbial pathogens *Giardia lamblia* and *Legionalla*, and promulgated National Primary Drinking Water Standards for all PWSs that are substantially reliant on surface water sources. The purpose of the IESWTR is to improve control of microbial pathogens in drinking water, particularly for the protozoan *Cryptosporidium*, and to guard against significant increases in microbial risk that might occur when systems implement the Stage 1 Rule (USEPA 1998). The major provisions of the IESTWR include an MCL goal of zero for *Cryptosporidium* and the required removal of 99 percent of *Cryptosporidium* from PWSs that serve 10,000 or more people.

Stage 2 Disinfectant Byproducts Rule and Long Term 2 Enhanced Surface Water Treatment Rule (Federal Register: January 5, 2006)

USEPA proposed the Stage 2 Disinfectants Byproducts Rule (Stage 2 Rule) in July 2003 as a result of information on health effects from byproducts in drinking water from use of chlorine as a disinfectant. The large number of people exposed to DBPs, and the potential for cancer, reproductive, and developmental risks associated with this exposure, led to the decision to implement regulations lowering permitted DBP exposures beyond the requirements of the Stage 1 Rule (USEPA 2003a). In addition, promulgation of the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWT Rule) was also required under the 1996 SDWA to ensure that drinking water is safe at limits set for DBPs under the Stage 2 Rule. Final regulations for both of these rules were promulgated on January 5, 2006.

Under the Stage 2 Rule, MCLs for TTHM and HAAs will remain at the levels set under the Stage 1 Rule; however, monitoring requirements for these DBPs will change. Primary monitoring changes will require all PWSs to carry out an Initial Distribution System Evaluation (IDSE), which aids in selecting monitoring locations for identifying high TTHM and HAA levels within the distribution system. Monitoring locations found to have elevated concentrations of TTHM and HAAs will need to make treatment or process changes to comply with the Stage 2 Rule. By identifying monitoring locations with elevated DBP concentrations, the IDSE would assist in ensuring that MCLs are met across the entire water system and would better control DBP peaks in the distribution system (USEPA 2003b). The Perdue WTP will be required to perform an IDSE 2½ years after the final Stage 2 Rule regulations are published.

The second monitoring requirement, designed to address variations in the times and locations of DBP exposure, will require new compliance calculations of MCLs through the use of a location running annual average (LRAA). The Stage 1 Rule for MCL compliance calculations are based

on a systemwide running annual average (RAA). Using only the RAA system wide annual average obscures identification of monitoring locations with elevated DBP concentrations by averaging these elevated locations with lower DBP concentrations elsewhere in the water system (USEPA 2003b). The LRAA improves the monitoring process by using the annual average at each monitoring location in the water system to determine compliance with MCLs. This will better ensure that each monitoring location is in compliance with MCLs and will provide customers with drinking water that meets MCLs more consistently (USEPA 2003a).

The Perdue WTP would be required to be in full compliance with current MCLs for TTHM and HAAs using the LRAA method, within 6 years after the final Stage 2 Rule regulations are published by USEPA.

Under the LTESWT2 Rule, the Authority would be required to conduct 2 years of monitoring its raw water sources at the Perdue WTP for *Cryptosporidium*. This monitoring would begin nine months after the final regulations for implementing the LTESWT2 Rule are published. The results of source water monitoring will allow USEPA to determine what additional treatment requirements, if any, should be implemented (USEPA 2003c). Depending on the results of the source water monitoring, the Authority would be required to achieve at least 99 or 99.9 percent inactivation of *Cryptosporidium*. A second round of source monitoring would be required six years after completion of the initial 2-year monitoring period.

California Department of Health Services

The California Department of Health Services (CDHS) Drinking Water Program regulates public drinking water systems, oversees water recycling projects, issues permits for water treatment devices, certifies drinking water treatment and distribution operators, supports and promotes water system security, provides support for improvements to small water systems, oversees the Drinking Water Treatment and Research Fund for methyl tertiary-butyl ether and other oxygenates, and provides subsidized funding for water system improvements under the State Revolving Fund and State Proposition 50.

Many federal and state laws and regulations have been developed and adopted to ensure that public drinking water is safe for human consumption. The majority of the California statutes are contained in Title 22, Chapter 15 of the California Code of Regulations. A key feature of California's SDWA is the requirement that no person may operate a public water system without having secured a domestic water supply permit from the CDHS. To ensure the safety of California's public drinking water systems, the CDHS adopts implementing regulations and

enforces the drinking water laws of California, and it has identified the following basic responsibilities of an owner or operator of a public water system:

- Knowledge of and compliance with all drinking water regulatory requirements
- Obtaining a domestic water supply permit
- Obtaining and maintaining an adequate source and quantity of water
- Providing appropriate treatment of the water supply
- Providing a distribution system that complies with the Waterworks Standards
- Hiring certified water system operators
- Providing continuous monitoring of the quality of the water
- Keeping the consumers informed
- Responding to emergencies

For the planned improvements at the Perdue WTP, CDHS staff would review proposed project plans for compliance with the state and federal SDWAs prior to commencement of construction. Upon completion of construction, they will review test results from the new treatment process for regulatory compliance. Every month, the Authority sends the results of their water quality testing to the CDHS to verify continued regulatory compliance of the drinking water distributed by the Authority to its customers.

Urban Water Management Planning Act

California's Urban Water Management Planning Act was established by Assembly Bill 797 in 1983 and codified on January 1, 1984. The state legislature amended the Act, with the most recent additions in 2004. The Urban Water Management Planning Act is addressed in California Water Code Division 6, Part 2.6, sections 10610 through 10657. This law recognizes that water is a limited resource and requires that efficient water use and conservation shall be actively pursued throughout the state. Water suppliers in California that provide water for municipal purposes either directly or indirectly to more than 3,000 customers or supply more than 3,000 acre-feet per year of water, must prepare an Urban Water Management Plan (UWMP). These plans describe current and future water use, sources of the water supply and its reliability, and existing conservation measures. The UWMP must be updated every 5 years, adopted by the water supplier's decision-making body, and submitted to the California Department of Water Resources. Accordingly, since 1985 the Authority has prepared UWMPs, which have also provided guidance in the planning and development of the Authority's capital improvement program, including the Perdue WTP Master Plan.

U.S. Environmental Protection Agency – Clean Water Act, National Pollutant Discharge Elimination System

In 1942, congress passed the federal water pollution control act (Clean Water Act), which was amended in 1972 to establish the National Pollutant Discharge Elimination System (NPDES). Initially the law focused on point sources, but later amendments recognized that non-point sources were major contributors to surface water pollution. USEPA eventually delegated the responsibility for NPDES compliance to individual states. In California, the SWRCB and the nine Regional Boards (RWQCBs) are the regulatory agencies.

State Water Resources Control Board – Statewide General Construction General Permit

In 1999, California issued SWRCB NPDES General Permit No. CAS000002, Order No. 99-09-DWQ, *Waste Discharge Requirements for Discharges of Stormwater Runoff Associated with Construction Activity* better known as the "Statewide General Construction Permit." The statewide permit was issued to avoid processing enumerable individual permits. Instead it provides a process though which individual projects would comply with the statewide permit through filing a Notice of Intent (NOI) to comply with the SWRCB Statewide General Construction Permit. The NOI describes the timing of the construction and the date that the Storm Water Pollution Prevention Plan (SWPPP) will be prepared. The SWPPP is not submitted, but retained on-site throughout the construction and for 3 years after the permit is terminated. It contains a detailed description of BMPs that will be implemented to prevent erosion and off-site transport of sediments and other pollutants in storm water during construction, and is considered a living document in which all aspects of compliance and noncompliance with the SWPPP are documented throughout the process. As of March 10, 2003, all projects disturbing more than 1 acre of land were required to file an NOI. The 3-year period through which the SWPPP must remain on-site is initiated when the applicant submits a Notice of Termination (NOT) and receives approval from the SWRCB. The proposed project will comply with the general construction permit as described.

San Diego Regional Water Quality Control Board – San Diego Municipal Stormwater Permit

Nonpoint source pollutants are concentrated in the Municipal Separate Storm Sewer Systems (MS4s) and, as a result of this concentration, these systems have been identified as the leading cause of water quality impairment in the San Diego region. To address this issue, each RWQCB is required to adopt a "Municipal Permit." All local jurisdictions with MS4s are required to be

signatory "co-permittees" on the Municipal Permit. MS4s include any feature that provides transport of urban runoff, including rivers and streams. With the RWQCB adoption of the San Diego Region 9 Order No. 2001-01 Municipal Stormwater Permit, co-permittees were required to minimize or eliminate the impact of human activities on receiving water bodies though adoption and enforcement of a Jurisdictional Urban Runoff Management Program (JURMP). A JURMP is a document describing how each co-permittee will comply with the Municipal Permit, describes the co-permittee's goals and objectives to implement Order 2001-01, provides evidence of legal authority, and includes a handbook of BMPs for each component of the co-permittee's urban runoff management program. A Standard Urban Stormwater Mitigation Plan (SUSMP) is a document that addresses managing runoff in development and redevelopment projects through site design and permanent BMPs and is required for specific types of development. The SUSMP includes descriptions of how hardscape, building footprints, and rooftops will be minimized to reduce impervious surfaces. In addition, the document describes permanent BMPs that allow for retention, treatment, and/or bio-filtration of urban runoff and provides a systematic program to ensure the effectiveness of the BMPs through proper maintenance. The Authority is a special purpose agency, acting as lead agency in approving all of its projects involving water service. This project lies within the County of San Diego, but because no County permits are required, there is no nexus that would necessitate submittal of a SUSMP to the County. If Sweetwater Authority proposes a non-water-service-related project, such as an office building or fishing project, a permit or other discretionary action may be required by the agency with land use jurisdiction (co-permittee). In that case, an Authority SUSMP must be prepared and submitted to the jurisdiction. Although an SUSMP will not be submitted, the project will be designed to incorporate site design elements and permanent BMPs that meet the intent of the SUSMP.

Clean Water Act

Activities within wetlands and other waters throughout the United States are regulated under Section 404 of the CWA. Pursuant to Section 404, the U.S. Army Corps of Engineers (USACE) regulates activities that result in discharge of dredged or fill material into the waters of the U.S. In accordance with the definition contained in the Code of Federal Regulations (33 CFR Part 328), the reservoir and intermittent streams on the site are considered to be waters of the U.S. and as such would be under the jurisdiction of USACE. The jurisdictional area extends up to the reservoir high water level and encompasses land only periodically inundated during water level increases. The riparian zone below Sweetwater Dam also falls under USACE jurisdiction. Impacts to these resources would require issuance of a permit pursuant to Section 404 of the

CWA. Since the project proposes to place less than 0.02 acre of riprap in jurisdictional waters, it would be eligible for a Nationwide Permit through the USACE.

California Fish and Game Code

Pursuant to Sections 1600-1607 of the California Fish and Game Code, the California Department of Fish and Game (CDFG) regulates activities that would alter the flow, bed, channel, or bank of streams and lakes. CDFG is a wildlife resource agency that regulates fish and wildlife rather than wetlands, thus restricting its jurisdiction to wildlife habitats and vegetation associated with lakes and streams. Alterations to lakes and streams and associated CDFG jurisdictional areas may be permitted through the issuance of a Streambed Alteration Agreement under Section 1601 or 1603 of the Fish and Game Code. Because areas of Sweetwater Reservoir and intermittent on-site streams that would be impacted by the project do not contain any vegetation, no requirement for a Streambed Alteration Agreement from CDFG is anticipated.

Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (FESA) provides protection to threatened and endangered species. Conservation measures to protect listed species under the FESA have often been based on preservation or enhancement of ecosystems that support threatened and endangered species. There are four state and/or federally listed species identified on the project site: California brown pelican, bald eagle, California gnatcatcher, and least Bell's vireo. California gnatcatcher breeding is expected on-site due to observations of collection and carrying of nest material by the on-site gnatcatcher population.

California Endangered Species Act

The California Endangered Species Act (CESA) parallels FESA. As a responsible agency, CDFG has regulatory authority over state-listed endangered and threatened species. Three of the four federally listed species are also listed as endangered by the state. The California gnatcatcher is not listed under CESA but is a state Species of Special Concern. In addition, the peregrine falcon is a state-listed endangered species, although it has not been identified within the project site.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 is an international agreement between the United States, Canada, and Mexico. The MBTA protects all common wild birds found in the United States except the house sparrow; starling; feral pigeon; and resident game birds such as pheasant, grouse, California quail, and wild turkeys. Resident game birds are managed separately by each state. A reference list of migratory game birds is found in Title 50, Code of Federal Regulations, Part 10. The MBTA makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import or export any migratory bird including feathers, parts, nests, or eggs. Generally, the resource agencies, i.e., U.S. Fish and Wildlife Service (USFWS) and CDFG, require that no clearing of habitat occur during the breeding season of most wild birds. This period usually extends from February 1 through August 31.

Natural Communities Conservation Program

Natural Communities Conservation Programs (NCCPs) are state-sponsored programs endorsed by the federal government to balance the needs of urban development and economic growth with species and habitat protection. NCCPs employ a multi-habitat and multi-species conservation planning approach, focusing on preserving the largest possible core habitat areas and protecting necessary habitat linkages and wildlife movement corridors that are necessary to maintain long-term biological and genetic diversity. In 1996, the Authority and other water districts initiated development of the Joint Water Agency (JWA) NCCP, which consists of a Subregional Plan and Subarea Plans (SAPs) for each participating water district. The JWA NCCP is considered complementary to the County MSCP because sensitive lands within water district ownerships were excluded from the County's plan. The JWA NCCP and its Environmental Impact Report/Environmental Impact Statement are nearing completion. Expansion of the Perdue WTP is included as a covered project in the Authority's SAP. This coverage provides take authorizations for covered species and their habitats, including any impacted by the project. In the event the JWA NCCP plan is not approved by the wildlife agencies before site clearing for the project is required, clearing may be authorized through the "4(d) rule" associated with the state and federal listing of the California gnatcatcher as a threatened species. This rule allows taking of up to 5 percent of coastal sage scrub that meets certain criteria for an agency actively preparing an NCCP SAP and has a Planning Agreement with CDFG. Passage of California Senate Bill 572 in 2003 extended this status to the Authority.

1.5.3 Consistency of Project with Applicable Regional and General Plans

The proposed project is located within the boundary of the Sweetwater Community Plan, a local planning area of the San Diego County General Plan. The Sweetwater Community Plan designates the Authority property, including the Perdue WTP and Sweetwater Reservoir as "Impact Sensitive." The Regional Land Use Element states that this designation "is applied to areas considered unsuitable for urban development for reasons of public safety or environmental sensitivity" (County of San Diego 1995). Nearby residential areas to the north are all located within urban residential designations of the Spring Valley Community Plan.

Pursuant to Section 53091 of the California Government Code, water treatment facilities constructed and operated by local agencies are not subject to county or city building or zoning ordinances. Continued operation of Sweetwater Reservoir water treatment facilities and protection of the local water supply are supported by the Sweetwater and Spring Valley Community Plans, and would be conducted in a manner consistent with the Water Quality Control Plan for the San Diego Basin (San Diego RWQCB 1994). The proposed project is also consistent with the Conservation Element of the County General Plan (County of San Diego 1993), which supports the availability of an adequate supply of potable water and reducing the County's reliance on imported water. The proposed improvements at the Perdue WTP are intended to respond to local community, city, and regional growth projections and land planning efforts.

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CHAPTER 2.0
SIGNIFICANT ENVIRONMENTAL EFFECTS

2.1 HYDROLOGY AND WATER QUALITY

The information related to existing and proposed drainage in this section is based upon a technical memorandum dated December 21, 2005, revised February, 15, 2006, prepared by the Authority, and included in Appendix B of this EIR. The memorandum characterizes the drainage conditions on the project site as well as the proposed drainage features. The project is subject to the Statewide General Construction Permit, described under Regulatory Setting in Section 1.0 (SWRCB NPDES General Permit No. CAS000002, Order No. 99-09-DWQ), *Waste Discharge Requirements for Discharges of Stormwater Runoff Associated with Construction Activity*. To comply with the permit, the Authority must file an NOI to Comply with the Statewide General Construction Permit with the SWRCB. Compliance requires that prior to any grading or construction, the NOI is submitted and a SWPPP is prepared and available on-site. The SWPPPs include a description of BMPs that the applicant will employ during construction, a monitoring program to ensure implementation of the BMPs, a list of responsible parties and contacts, and other details of construction activities. The SWPPP is a working document that is updated and modified throughout construction to detail any changes in implementation of BMPs, any noncompliance, and resolution thereof. Upon completion of construction, the applicant must file an NOT with the RWQCB. The SWPPP must be retained on-site for 3 years after acceptance of the NOT.

As described in Section 1.0, this project lies within the County of San Diego, the lead co-permittee on the San Diego Municipal Permit. The project is a water service-related project for which the Authority, a special purpose agency, is the Lead Agency. Since no County permits are required, there is no nexus to necessitate submittal of an SUSMP to the County. However, the project will be designed with the intent of complying with the County's Standard Urban Storm Water Mitigation Plan (County of San Diego 2003) and the Model SUSMP (San Diego County et al. 2002) as jointly developed by the San Diego co-permittees, which include the County of San Diego, the Port of San Diego, and 18 cities in San Diego County.

2.1.1 Existing Conditions

The proposed project is located within the Sweetwater Hydrologic Unit (909.11 – 909.35), which encompasses approximately 230 square miles with over 86 percent of the watershed within unincorporated areas of San Diego County. This unit is defined in the Basin Plan as an elongated area following the length of Sweetwater River stretching from the eastern boundary of RWQCB Region 9 in the Laguna Mountains to San Diego Bay. Major water bodies include Sweetwater River, Sweetwater Reservoir, and Loveland Reservoir. Between its headwaters and the outlet to San Diego Bay, the Sweetwater River watershed contains a variety of habitat types, including oak and pine woodlands, riparian forest, chaparral, coastal sage scrub, and coastal salt marsh, as well as urbanized areas with a variety of densities. Sweetwater Reservoir is a drinking water reservoir that receives water from the Sweetwater River watershed, as well as imported water from County Water Authority, with the quality affected by watershed development and activities.

URDS is located along the north side of the reservoir, and collects surface runoff from upstream and adjacent urbanized areas, transporting it via flumes, pipelines, ponds, and pump stations to an outlet below Sweetwater Dam. The system is designed to minimize the flow of urban pollutants into the Sweetwater Reservoir by capturing runoff from the "first flush" of storms and poor quality "low flow" runoff during the dry season. The system is also designed to capture hazardous spills that can be pumped and removed from the facility. Where the URDS pipeline traverses the project site, it is 20-inches in diameter and within an existing paved road. Runoff from the project site results from rainfall and from non-storm water sources such as irrigation and plant maintenance activities, with quality affected by Perdue WTP operations and resident wildlife.

The topography of the project site varies from 230 to 315 feet AMSL with moderately steep slopes toward Sweetwater Reservoir. Portions of the project site have been graded and developed. The majority of that developed area is located within the 8.35-acre Perdue Plant drainage basin and contains the treatment plant complex and most of the existing facilities. Runoff in the basin drains through vegetated channels and concrete swales in the roadways, as well as some underground storm drains, with collected runoff discharged below Sweetwater Dam.

For the purpose of the drainage technical memorandum (Appendix B), the site was divided into 4 basins: the 8.35-acre developed are described above and sub-basins 1, 2, and 3, which are generally undeveloped with sheet flows draining southerly through vegetated areas toward

the reservoir. However, only the generally undeveloped sub-basins 1 and 2 and the proposed paved access road are relevant to this drainage study. Outlets from the existing drainage system discharge into the lower Sweetwater River or the Sweetwater Reservoir. Undeveloped portions of the site drain through vegetated areas into the reservoir, Sweetwater River, or Spring Valley Creek.

The other three basins, sub-basin 1, 2, and 3, are undeveloped with sheet flows draining southerly through vegetated areas toward the reservoir. However, only the generally undeveloped sub-basins 1 and 2 and the proposed paved access road are relevant to this drainage study. Outlets from the existing drainage system discharge into the lower Sweetwater River or the Sweetwater Reservoir. Undeveloped portions of the site drain through vegetated areas into the reservoir, Sweetwater River, or Spring Valley Creek.

The Authority would be required to amend its existing Domestic Water Supply Permit issued by the CDHS, Office of Drinking Water. The amendment would allow for an altered water treatment process for the Perdue WTP. Although CDHS will be provided with a copy of all relevant project notices and documents, the agency does not approve the amendment until after construction and testing.

2.1.2 Impacts

Construction

Potential significant impact could result from inadequate containment of sediment from grading and other construction operations and from fuels associated with construction equipment, such as from leaks or during maintenance and fueling.

Operations

Runoff from sub-basins 1 and 2 would drain into sub-basin 3 via culverts under the proposed access road, with riprap placed at the discharge points across the road. Since there would be no additional development in sub-basins 1 and 2, there would be no increase in runoff or velocity.

The membrane facilities and access road would increase the impermeable surfaces on-site by 0.83 acre. Due to the on-site substrate, permeable paving would not be appropriate for the proposed project and the access would be paved with asphalt. As previously described, the Authority captures and treats the urban runoff from adjacent urbanized areas and redirects it, as

appropriate. Similarly, first flush drainage associated with the access road and membrane facilities would be collected into a surface drainage catch basin adjacent to the access road and would flow southeasterly through a drain line into the proposed sump drain structure. From the proposed sump drain structure, the runoff would be pumped into the URDS pipeline approximately 40 feet to the south.

In addition, the proposed project would change the water treatment process in response to new surface water treatment requirements issued by USEPA, as discussed in Chapter 1.0. The proposed treatment process in comparison to the existing process is shown in Figure 1.8. The upgraded treatment process would not include the use of potassium permanganate. The proposed upgrades provide the necessary facilities to meet and exceed future regulations as well as to provide for added supply reliability.

2.1.3 Significance of Impacts

Significant water quality impacts could result from sediment runoff during construction activities, runoff from impervious areas such as parking lots and rooftops, and the mishandling and/or accidental releases of chemicals. In addition, equipment storage areas and trash receptacles could pose potential significant impacts to water quality if they are not properly managed and maintained.

2.1.4 Mitigation Measures

Construction and operation activities at the Perdue WTP could cause significant water quality impacts. To reduce potential water quality impacts during construction to a less than significant level, the Authority shall implement water quality protection measures and comply with the General Construction Permit as detailed below:

1. Prior to commencement of grading, and to obtain coverage under the SWRCB NPDES General Permit for Construction Activity, the Authority shall submit an NOI to prepare an SWPPP that incorporates all conditions of the Permit.

2. Prior to commencement of grading, the SWPPP shall be completed, and shall detail proposed methods to preclude runoff and contaminants from leaving the construction site. The SWPPP will include forms and maps for the documentation of all compliance and noncompliance of construction activities, and shall remain on-site for 3 years after the RWQCB acceptance of the NOT.

3. The manager for the construction contractor shall be responsible for implementing and maintaining the SWPPP as follows:
   a. Documentation of BMP implementation, as well as documentation of any changes in the implementation described in the SWPPP.
   b. Ensuring that appropriate staff and subcontractors receive training in SWPPP compliance, and that training is documented in the SWPPP.
   c. Maintenance and monitoring of BMPs to ensure that they are working properly until the construction area has been permanently stabilized.

4. The following mitigation, monitoring, and reporting measures will be included in the SWPPP:
   a. The grading plans shall note the condition requiring an SWPPP and monitoring plan, and the BMPs outlined in the SWPPP shall be incorporated into the grading plan to reduce the amount of pollutants and sediments in construction surface runoff before discharge into Sweetwater Reservoir and Sweetwater River.
   b. Prior to commencement of grading, and as part of the SWPPP, appropriate contractors will be trained in SWPPP implementation and compliance. All training will be documented and inserted into the SWPPP.
   c. Prior to commencement of grading and as part of the SWPPP, the Authority shall prepare an erosion control plan for the construction phase. The plan will ensure that all erosion and runoff control measures are in place prior to major grading activities, and that exposed slopes and graded areas are protected throughout construction. BMPs shall include the short-term use of silt fences, gravel bags, fiber rolls, erosion control blankets, and/or similar devices.
   d. All soils to be stockpiled shall be protected from erosion and sediment runoff at all times. Stockpiles shall be protected through the use of gravel bags or similar mechanisms near the base of the piles and covered with secured tarps or tackifiers.

5. Stockpiles, refueling activities, and storage areas of hazardous materials (e.g., fuels, lubricants, solvents, and other potential contaminants) shall be located only at predesignated sites with adequate pollution control, as specified in the construction drawings that will be displayed in the construction trailer as required in the SWPPP.

6. Prior to commencement of grading, and as a part of the SWPPP, the Authority shall prepare a construction spill contingency plan in accordance with County Department of Environmental Health regulations. The plan will detail such issues as the disposition of soil contaminated by spills. The contractor's construction manager shall be responsible

for compliance with the plan, which shall be retained on-site and available for inspection throughout construction.

7. Stockpiles, refueling activities, and storage of fuels and other potential contaminants shall be located at designated staging areas, as specified in the construction drawings, and detailed in the spill contingency plan and SWPPP.

To reduce post-construction and operational impacts on water quality to below a level of significance, the project design shall:

1. Ensure that the drainage facilities are properly sized and designed to control runoff and that drains are directed to sedimentation basins, swales, mechanical trapping devices, riprap or similar devices to minimize the potential for erosion and sedimentation and to minimize water quality impacts. As an ongoing condition of the plan, the drainage system shall be inspected every four (4) months, and cleaned and maintained as necessary to ensure that the system functions properly.

2. Appropriate post-construction BMPs shall be incorporated in the project design.

3. Exposed slopes shall be revegetated or hydroseeded within 30 days after completion of site grading.

4. Native vegetation shall be preserved, wherever feasible, for immediate replacement on disturbed areas following grading. Native topsoil shall be stockpiled and reapplied as part of site reclamation.

5. Surface and subsurface drainage shall be designed to preclude ponding outside of areas designated for drainage containment.

2.2 AIR QUALITY

This section describes the setting and potential air quality impacts of the proposed construction of the Perdue WTP Master Plan improvements. Specifically, this section discusses federal and state ambient air quality standards and existing air quality conditions in the project area, identifies sensitive receptors in the project area, and describes the overall regulatory framework for air quality management in California and the region. Information presented in this section is based in part on communication with the San Diego Air Pollution Control District (SDAPCD).

2.2.1 Existing Conditions

Air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions, which influence movement and dispersal of pollutants. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

Regional Climate

The proposed project is located in the San Diego Air Basin (SDAB), which is contiguous with San Diego County. The climate of San Diego County is characterized by warm, dry summers and mild, wet winters. One of the main determinants of the climatology is a semipermanent high-pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of California. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation. In San Diego County, the months of heaviest precipitation are November through April, averaging about 9 to 14 inches annually. The mean temperature is 62.2°F, and the mean maximum and mean minimum temperatures are 75.7°F and 48.5°F, respectively.

A common atmospheric condition known as a temperature inversion affects air quality in San Diego. During an inversion, air temperatures get warmer rather than cooler with increasing height. Subsidence inversions occur during the warmer months (May through October) as descending air associated with the Pacific high-pressure cell comes into contact with cool marine air. The boundary between the layers of air represents a temperature inversion that traps pollutants below it. The inversion layer is approximately 2,000 feet AMSL during the months of May through October. During the winter months (November through April), the temperature

inversion is approximately 3,000 feet AMSL. Inversion layers are important elements of local air quality because they inhibit the dispersion of pollutants, thus resulting in a temporary degradation of air quality.

Federal and State Standards

The Federal Clean Air Act (CAA) (USC § 7401) requires the adoption of National Ambient Air Quality Standards (NAAQS) to protect the public health, safety, and welfare from known or anticipated effects of air pollution. The NAAQS have been updated occasionally. Current standards are set for sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), suspended particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead (Pb). These pollutants are collectively referred to as criteria pollutants. The State of California Air Resources Board (CARB) has established additional standards that are generally more restrictive than the NAAQS. Federal and state standards are shown in Table 2.1.

Federal standards for 8-hour O_3 and $PM_{2.5}$ became effective on September 15, 1997, and were subsequently challenged and litigated. The U.S. Supreme Court affirmed the standards, and policies and systems to implement these new standards are being developed. Attainment designations for 8-hour O_3 were formally published on April 15, 2004, and attainment designations for $PM_{2.5}$ were formally published on December 17, 2004, and revised on April 5, 2005 (USEPA 2005).

Regional Standards

In San Diego County, the SDAPCD is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws and policies. Included in the SDAPCD's tasks are the monitoring of air pollution, the preparation of the San Diego County portion of the State Implementation Plan (SIP), and the promulgation of Rules and Regulations. The SIP includes strategies and tactics to be used to attain and maintain acceptable air quality in the county; this list of strategies is called the Regional Air Quality Strategy (RAQS). The Rules and Regulations include procedures and requirements to control the emission of pollutants and prevent significant adverse impacts. SDAPCD Rule 51 states that a person "shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public; or which endanger the comfort, repose, health or safety of any such persons or the public; or which cause or have a natural tendency to cause injury or damage to business or property."

Table 2.1
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	Secondary[4]	Concentration[5]
Ozone (O_3)[6]	1-Hour	0.12 ppm (235 µg/m^3)	Same as Primary Standard	0.09 ppm (180 µg/m^3)
	8-Hour	0.08 ppm (157 µg/m^3)		0.070 ppm (137 µg/m^3)[9]
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	None	9.0 ppm (10 mg/m^3)
	1-Hour	35 ppm (40 mg/m^3)		20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m^3)	Same as Primary Standard	-
	1-Hour	-		0.25 ppm (470 µg/m^3)
Sulfur Dioxide (SO_2)	Annual Average	0.03 ppm (80 µg/m^3)	-	-
	24-Hour	0.14 ppm (365 µg/m^3)	-	0.04 ppm (105 µg/m^3)
	3-Hour	-	0.5 ppm (1300 µg/m^3)	-
	1-Hour	-	-	0.25 ppm (655 µg/m^3)
Suspended Particulate Matter (PM_{10})	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	50 µg/m^3		20 µg/m^3 note 7
Fine Particulate Matter ($PM_{2.5}$)[6]	24-Hour	65 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	15 µg/m^3		12 µg/m^3 note 7
Lead (Pb)[8]	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (HS)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific Standard Time)			In sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70 percent.
Vinyl chloride[8]	24 Hour			0.01 ppm (26 µg/m^3)

[1] NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the USEPA for further clarification and current federal policies.

[2] California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

[3] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[4] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[5] Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[6] New federal 8-hour ozone and fine particulate matter standards were promulgated by USEPA on July 18, 1997. The federal 1-hour O_3 standard continues to apply in areas that violated the standard. On April 15, 2004 the USEPA issued attainment designations for the 8-hour standard and described plans for the phase out of the 1-hour standard (USEPA 2004).

[7] On June 5, 2003, the Office of Administrative Law approved the amendments to the regulations for the state ambient air quality standards for particulate matter and sulfates. Those amendments established a new annual average standard for $PM_{2.5}$ of 12 µg/m^3 and reduced the level of the annual average standard for PM_{10} to 20 µg/m^3. The approved amendments were filed with the Secretary of State on June 5, 2003. The regulations became effective on July 5, 2003.

[8] The CARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[9] The Air Resources Board approved this concentration on April 28, 2005 and it is expected to become effective in early 2006.

Ppm = parts per million; µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter
Source: CARB 2005b; USEPA 2004

Regional and Local Air Quality

Specific geographic areas are classified as either "attainment" or "nonattainment" areas for each pollutant based on the comparison of measured data with federal and state standards. If an area is redesignated from nonattainment to attainment, the CAA requires a revision to the SIP, called a maintenance plan, to demonstrate how the air quality standard will be maintained for at least 10 years.

The SDAB currently meets the federal standards for all criteria pollutants except O_3 and meets state standards for all criteria pollutants except O_3, $PM_{2.5}$, and PM_{10}. San Diego County completed 3 years within the federal 1-hour O_3 standard on November 15, 2001, becoming eligible for redesignation as an attainment area. Formal redesignation by USEPA as an O_3 attainment area occurred on July 28, 2003, and a maintenance plan was approved. On April 15, 2004, USEPA issued the initial designations for the 8-hour O_3 standard, and the SDAB is classified as "basic" nonattainment. Basic is the least severe of the six degrees of O_3 nonattainment. The SDAPCD must submit an air quality plan to USEPA in 2007; the plan must demonstrate how the 8-hour O_3 standard will be attained by 2009 (SDAPCD 2004).

The SDAB is currently classified as a state "serious" O_3 nonattainment area and a state nonattainment area for PM_{10}. For $PM_{2.5}$, the SDAB is currently classified as a federal attainment area and state nonattainment area. The SDAB currently falls under a federal "maintenance plan" for CO, following a 1998 redesignation as a CO attainment area.

Ambient air pollutant concentrations in the SDAB are measured at 10 air quality monitoring stations operated by the SDAPCD. The closest SDAPCD air quality monitoring station is at 80 East J Street in Chula Vista, approximately five miles southwest of the project. Monitoring by the station includes CO, SO_2, NO_2, O_3, PM_{10}, $PM_{2.5}$, toxics, outdoor temperature, wind direction, and horizontal wind speed. Table 2.2 summarizes the standards exceeded and the highest pollutant levels recorded at this station for the years 2002 through 2004.

The Authority also has a monitoring station that was installed in anticipation of construction of State Route 125 approximately 450 yards upwind of the Sweetwater Reservoir. Modeling performed by a consultant hired by the Authority predicted the loading to the reservoir from a variety of toxic compounds generated from State Route 125 could cause water in the reservoir to exceed guidance levels for one or more contaminants. The USGS developed a monitoring study to measure impacts from the new freeway, and baseline monitoring began in September 1998. The study objectives are to compare analytical results of samples from air, water, and bed

Table 2.2
Air Quality Monitoring Data at the Chula Vista Station

Pollutant Standards	2002	2003	2004
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.115	0.075	0.097
Maximum 8-hour concentration (ppm)	0.073	0.056	0.087
Number of Days Standard Exceeded			
NAAQS 1-hour (>0.12 ppm)	0	0	0
CAAQS 1-hour (>0.09 ppm)	1	0	1
NAAQS 8-hour (>0.08 ppm)	0	0	1
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)			
Maximum 1-hour concentration (ppm)			
Number of Days Standard Exceeded			
NAAQS 8-hour (≥9.0 ppm)	0	0	0
CAAQS 8-hour (≥9.0 ppm)	0	0	0
NAAQS 1-hour (≥35 ppm)	0	0	0
CAAQS 1-hour (≥20 ppm)	0	0	0
Particulate Matter (PM_{10})[a]			
National maximum 24-hour concentration (μg/m^3)	50	75	44
National second highest 24-hour concentration (μg/m^3)	45	65	43
State maximum 24-hour concentration (μg/m^3)	52	78	45
State second highest 24-hour concentration (μg/m^3)	47	68	44
National[b] annual average concentration (μg/m^3)	26.5	27	25.8
State[c] annual average concentration (μg/m^3)	27.1	27.6	26.5
Number of Days Standard Exceeded			
NAAQS 24-hour (>150 μg/m^3)[d]	0	0	0
CAAQS 24-hour (>50 μg/m^3)[d]	1	2	0
Particulate Matter ($PM_{2.5}$)			
Maximum 24-hour concentration (μg/m^3)	41	239.2	32.7
Second highest 24-hour concentration (μg/m^3)	38.1	40.9	32.5
National [b] annual average concentration (μg/m^3)	13.9	14.4	12.2
State[c] annual average concentration (μg/m^3)	13.9	14.4	12.2
Number of Days Standard Exceeded			
NAAQS 24-hour (>65 μg/m^3)	0	1	0

Notes:
CAAQS = California Ambient Air Quality Standards
NAAQS = National Ambient Air Quality Standards
NA = Insufficient data available to determine the value
(a) Measurements usually collected every 6 days.
(b) National annual average based on arithmetic mean.
(c) State annual average based on geometric mean.
(d) Based on an estimate of how many days concentrations would have been greater than the standard.
Sources: CARB 2005a; USEPA 2005

sediments and determine whether any measured changes in water quality in the reservoir are a result of atmospheric deposition from the construction and operation of State Route 125. Elements monitored in both air and water are volatile organic compounds (VOCs), polynucleararomatic hydrocarbons (PAHs), and total metals. The study is proposed to last approximately until 2009 or 2010, or as funding permits.

"Air Pollution" is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants may adversely affect human or animal health, reduce visibility, damage property, and reduce the productivity or vigor of crops and natural vegetation.

Seven air pollutants have been identified by USEPA as being of concern nationwide: CO, O_3, NO_2, PM_{10}, $PM_{2.5}$, SO_2, and Pb. These pollutants are collectively referred to as criteria pollutants. The sources of these pollutants, their effects on human health and the nation's welfare, and their final deposition in the atmosphere vary considerably.

In the San Diego area, ambient concentrations of CO, O_3, and Pb are primarily influenced by motor vehicle activity. Emissions of sulfur oxides (SO_X) are associated mainly with various stationary sources. Emissions of nitrogen oxides (NO_X) and particulate matter come from both mobile and stationary sources.

Ozone. O_3 is a respiratory irritant that is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. O_3 precursors, which include reactive organic gases (ROG) and NO_X, react in the atmosphere in the presence of sunlight to form O_3. Because photochemical reaction rates depend on the intensity of UV light and air temperature, O_3 is primarily a summer air pollution problem. The O_3 precursors, ROG and NO_X, are emitted by mobile sources and by stationary combustion equipment.

State and federal standards for O_3 have been set for a 1-hour averaging time. The state 1-hour O_3 standard is 0.09 parts per million (ppm), not to be exceeded. The federal 1-hour O_3 standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period. USEPA set the 8-hour standard based on the scientific evidence that O_3 causes adverse health effects at lower O_3 concentrations, over longer periods of time, than the 1-hour standard addressed.

Carbon Monoxide. CO is essentially inert to plants and materials but can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period.

Inhalable Particulates. Particulates can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates also reduce visibility and corrode materials. The federal and state ambient air quality standard for particulate matter applies to two classes of particulates: $PM_{2.5}$ and PM_{10}.

The state PM_{10} standards are 50 micrograms per cubic meter (μ/m^3) as a 24-hour average and 20 μ/m^3 as an annual arithmetic mean. The federal PM_{10} standards are 150 μ/m^3 as a 24-hour average and 50 μ/m^3 as an annual arithmetic mean. The federal $PM_{2.5}$ standards are 15 μ/m^3 for the annual average and 65 μ/m^3 for the 24-hour average. On June 20, 2002, the CARB adopted a new annual $PM_{2.5}$ standard of 12 μ/m^3.

Toxic Air Contaminants. Toxic air contaminants (TACs) are pollutants that may be expected to result in an increase in mortality or serious illness or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. The CARB has an ongoing program to identify TACs. Among the many substances identified as a TAC are asbestos, dioxin, and diesel exhaust particulates (CARB 2005c).

Sensitive Receptors

For the purposes of this analysis, sensitive land uses are defined as locations where people reside or where the presence of pollutant emissions could adversely affect the use of the land. Typical sensitive receptors include residents, school children, hospital patients, and the elderly. The sensitive receptors within the vicinity of the project site are the occupants of the single-family neighborhood located to the north and east of the project.

2.2.2 Impacts

Construction Emissions

Construction of the proposed project would result in the temporary generation of emissions of CO, ROG, NO_X, PM_{10}, and $PM_{2.5}$. Emissions would originate from mobile and stationary construction equipment exhaust, vehicle exhaust, dust from clearing the land, exposed soil

eroded by wind, and VOCs from architectural coatings and asphalt paving. Construction-related emissions would vary substantially depending on the level of activity, length of the construction period, specific construction operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content.

A detailed inventory of construction equipment that would be used for the proposed project has not been developed; therefore, this analysis is based on anticipated construction equipment calculated by the URBEMIS2002 computer program that would be used during construction activities, summarized in Table 2.3 for the Phase I improvements and Table 2.4 for the Phase II improvements. Construction-related emissions for the proposed improvements of the water treatment plant were estimated and analyzed based on the anticipated construction equipment inventory from Tables 2.3 and 2.4, emission factors from the CARB, and URBEMIS2002, a computer program used to estimate construction emissions, vehicle trips, emissions, and fuel use resulting from land use development projects. For the purpose of this project, this model was used to estimate construction emissions. To estimate construction emissions, URBEMIS2002 analyzes the type of construction equipment used and the duration of the construction period. It was assumed that construction activities would occur for 12 hours per day, with each phase of construction occurring separately. Construction activities were divided into separate phases and analyzed separately. Consequently, project significance is not a comparison of the sum of all construction phases to SDAPCD threshold levels. Instead, if one phase of construction is found to have a significant impact, then the entire project is considered to have a significant air quality impact.

The Phase I project would also generate approximately 19,000 cy of excavated soil and rock. If it is disposed of off-site, approximately 1,200 round trips (19,000/16 cy per truck) would be required during the construction process. Construction of the concrete basins, operations office, restrooms, chemical storage facilities, and electrical and air compression facilities would occur through June 2009. During the building construction phase, paving and finishing of the road would also occur. Approximately 0.7 acre is anticipated to be paved. Paving is anticipated to start in the beginning of the construction phase to reduce fugitive dust emissions from the project site.

Table 2.5 shows the maximum emissions that would be generated from Phase I improvement construction activities. These assumptions were used in the analysis and the detailed calculations.

As shown in Table 2.5, construction-related emissions generated by the proposed project would be below the annual and daily thresholds of significance. Therefore, construction activities associated with the proposed project would not have a significant impact on air quality.

Table 2.3
Anticipated Project Construction Equipment for Phase I Improvements

Construction Phase and Equipment	Number of Equipment Pieces
Demolition of Butler Building Foundation and removal of the building	1
Off-Highway Truck	1
Rubber Tired Dozer	1
Tractors/Loaders/Backhoes	1
Site Grading	
Rubber Tired Dozer	1
Tractors/Loaders/Backhoes	1
Scrapers	1
Building Construction	
Crane	1
Off-Highway Trucks	3
Rough Terrain Fork Lift	1
Grader	1
Paver	1
Roller	1

Note: Equipment inventory is calculated by the URBEMIS2002 computer modeling program, based on project land use type and size of land use, and augmented based on project requirements.

Table 2.4
Anticipated Project Construction Equipment for Phase II Improvements

Construction Phase and Equipment	Number of Equipment Pieces
Demolition of the clear well.	
Off-Highway Truck	1
Rubber Tired Dozer	1
Tractors/Loaders/Backhoes	1
Site Grading	
Rubber Tired Dozer	1
Tractors/Loaders/Backhoes	1
Scrapers	1
Building Construction	
Crane	1
Off-Highway Trucks	1
Other Equipment	1
Tractors/Loaders/Backhoes	1
Trencher	1

Note: Equipment inventory is calculated by the URBEMIS2002 computer modeling program, based on project land use type and size of land use, and augmented based on project requirements.

Table 2.5
Estimated Construction Emissions for Phase I Improvements

	Estimated Emissions			
	VOC	**NO_X**	**CO**	**PM_{10}**
2006 Annual Emissions (Tons/Year)	1	7	5	0
2007 Annual Emissions (Tons/Year)	1	7	9	0
Annual Construction Thresholds (Tons/Year)	*50*	*50*	*100*	*50*
Exceedance of Annual Thresholds (Tons/Year)	No	No	No	No

Notes: The URBEMIS2002 model was used to estimate construction emissions.
Emissions were based on equipment usage estimates shown in Table 2.3.
Source: Jones & Stokes Associates 2005

Construction activities for the proposed Phase II improvements would be conducted in separate construction phases over an uncertain number of years. Estimates of emissions are anticipated to be similar or less than Phase I, depending on location and grading quantities required for individual projects.

Operation-Related Emissions

Sources of operation-related emissions include motor vehicle exhaust and area source emissions from diesel generators, landscape maintenance, and other similar activities. The majority of the proposed Phase I and Phase II operational facility improvements are anticipated to be electrically powered and would generate pollutant emissions. The only exception to that would be a proposed 500 kW standby generator. For assessment purposes, an EPA Certified Tier II, Caterpillar Model DM8155, Standby 500 kW diesel fuel generator (DM8155) is used to estimate emissions. During normal operation, the generator would not operate on a continual basis and would serve as an emergency back-up for power failures. The only regularly schedule operation of the generator would be once a week for 15 minutes for maintenance purposes and readiness testing. The emissions associated the proposed generator would be minor (1.35 pounds of NO_X per week and 0.09 pounds of CO per week) and would not violate applicable thresholds. Therefore, no significant air emissions of criteria pollutants or air toxics would be generated by the proposed improvements and no significant impacts would occur from operations.

Consistency with the San Diego Regional Air Quality Strategies

Consistency with the SDAPCD RAQS is determined by two standards. The first standard is if the project would increase the frequency or severity of violation of existing air quality violations, contribute to new violations, or delay the timely attainment of air quality standards or interim

reductions as specified in the RAQS. The second standard is whether the project would exceed assumptions contained in the RAQS.

Based on the air quality emissions modeling contained in this report, it is expected that there would be less than significant short-term construction impacts and no long-term operational impacts on air quality due to the proposed project.

Consistency with the RAQS assumption is determined by analyzing the project with the assumptions in the RAQS. Thus, the emphasis of this criterion is to ensure that the analyses for the project are based on forecasts similar to the RAQS. Forecasts used in the RAQS are developed by the San Diego Association of Governments (SANDAG). The SANDAG forecasts are based on local general plans and other related documents that are used to develop population projections and traffic projections. As the proposed project improvements are designed to serve an existing urbanized area, the proposed project would not induce population growth. The proposed project would not provide additional housing or a significant increase in available jobs in the San Diego County area. The proposed project is intended to meet forecasted growth, which was developed from SANDAG forecasts. As a result, the proposed project would not obstruct or conflict with SDAPCD RAQS.

Odors

Odors are one of the most obvious forms of air pollution to the general public. Odors can present a significant problem for both the source and the surrounding community. Offensive odors seldom cause any physical harm. Sometimes offensive odors cause agitation, anger, and concern to the public about the possibility of health effects, especially in residential neighborhoods located near industrial sources. One public concern is that offensive odors may cause adverse health effects, but that is not necessarily the case. For example, hydrogen sulfide gas, which has a very unpleasant rotten egg odor, is not toxic at low concentrations.

The proposed project would not have any significant odor sources and any odors generated would be similar in nature to odors from typical residential land uses. The proposed improvements for Phase I and Phase II are not anticipated to produce odors. Odor control equipment is used in the water treatment plant to reduce odors. During a site visit, no unusual or objectionable odors were detected from on-site or off-site land uses. Thus, the proposed project is not anticipated to be exposed to, or generate, significant odors.

2.2.3 Significance of Impacts

As shown in the preceding analysis, neither construction nor operation of the proposed project would result in a violation of local, state, or federal ambient air quality standards or an exceedance of the identified thresholds in Table 2.5. The proposed project would not create or increase in severity or frequency, violations of applicable air quality standards. The proposed project would not induce population growth nor provide additional housing or a significant increase in available jobs in the San Diego County area. The proposed project is intended to meet forecasted growth, which was developed from SANDAG forecasts. Thus, the proposed project would not obstruct or conflict with SDAPCD RAQS. The proposed project would not expose people to objectionable odors. Therefore, the proposed project would result in less than significant impacts on regional and local air quality.

2.2.4 Mitigation Measures

Although there would be no significant impact from fugitive dust and particulate emissions, the Authority would incorporate the following measures into the project to minimize the emissions of PM_{10}, and $PM_{2.5}$ and comply with SDAPCD Rule 51:

- Minimize land disturbance.
- Use watering trucks to minimize dust – watering should be sufficient to confine dust plumes to the project work areas.
- Suspend grading and earth moving when wind gusts exceed 25 miles per hour unless the soil is wet enough to prevent dust plumes.
- Cover trucks when hauling dirt.
- Stabilize the surface of dirt piles if not removed immediately.
- Install a gravel bed at the northerly terminus of the dirt access road to prevent dirt track-out onto the paved road.
- Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway.
- Revegetate disturbed land as soon as feasible
- Remove unused material.

2.3 NOISE

2.3.1 Existing Conditions

This section describes the noise setting in the project area, discusses relevant regulations, and identifies noise impacts of the proposed project. Mitigation measures to reduce potentially significant impacts are also discussed.

The following are brief definitions of acoustical terms used in this discussion:

Sound—A vibratory disturbance created by a vibrating object that, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism such as the human ear or a microphone.

Noise—Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

Ambient noise—The composite of noise from all sources near and far in a given environment, exclusive of particular noise sources to be measured.

Decibel (dB)—A unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-Pascals.

A-Weighted Decibel (dBA)—An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

Equivalent Sound Level (L_{eq})—The equivalent steady state sound or vibration level that, in a stated period of time, would contain the same acoustical or vibration energy.

Day-Night Level (L_{dn})—The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10 p.m. to 7 a.m.

Community Noise Equivalent Level (CNEL)—The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.

In general, human sound perception is such that a change in sound level of three dB is just noticeable, a change of five dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the noise level.

Existing Noise Levels

Existing noise level measurements were conducted on November 9, 2005, between 11:27 a.m. and 2:20 p.m. and on March 22, 2006, between 3:00 p.m. and 4:20 p.m. An additional long-term measurement was conducted on April 6, 2006, beginning at 3:00 p.m. and ending April 7, 2006, at 3:00 p.m. During all short-term measurements the weather was generally overcast with moderate breezes from the west with occasional gusts. During the long-term measurement the weather was clear with calm winds.

All noise measurements were taken with a sound level meter set on "fast" response and "A-weighting." The meter was positioned 5 feet above the existing ground elevation at all measurement locations. The results of the short-term field noise measurements are summarized in Table 2.6 and the 24-hour measurement is summarized in Table 2.7. The noise measurement locations are shown in Figure 2.1.

Table 2.6
Short-term Noise Measurement Data

Site	Location	Time	Duration (Minutes)	L_{eq} (dBA)	Noise Source
1	Within treatment plant 3 feet from loudest active pump motor, 7 horsepower electric motor	11:27 a.m. - 11:37 a.m.	10	61	Existing pump, occasional aircrafts, back-up alarm on truck, distant landscaping
2	50 feet south of the southeastern boundary of the sedimentation basins, near a weather station	11:40 a.m. – 11:50 a.m.	10	54	Aircraft, on-site car and truck drive-by, birds chirping
3	Southeast corner of 8915 Corte Quezada, nearest residence to construction	11:59 a.m. – 12:19 p.m.	21	52	Aircraft, distant dog barking, distant leaf blower
4	Rear of 8921 Jamie Ct., northern edge of property boundary	12:25 p.m. – 12:51 p.m.	27	56	Aircraft, wind chimes, distant construction on SR 125/54, back-up alarms
5	108 Arran Ave., northwest corner of property boundary	12:59 p.m. – 1:22 p.m.	24	55	Aircrafts, distant saw, tractors, back-up alarms, traffic on SR 125
6	Proposed staging area	1:32 p.m. - 1:56 p.m.	20	52	Aircraft, birds chirping
7	125 feet east of the center of the backwash pumps	3:00 p.m. – 3:55 p.m.	55	56	Dominant noise during measurement was filter back wash activities, including operation of pumps refilling tanks
8	150 feet southwest of Quarry Rd. and Lakeview Ave., 50 feet south of Lakeview Ave.	1:59 p.m. – 2:19 p.m.	21	55	Aircraft, traffic on Lakeview Ave

* The measurement sites are shown in Figure 2.1.

Figure 2.1
Noise Measurement Locations

Path: P:\2004\4K004 R Perdue WTP MP Sweetwater Authority\5GIS\Mxd\Noise Measurement Locations.mxd, 05/05/06, LuoW

Table 2.7
24-Hour Noise Measurement Data

Time	dBA L_{eq}
0:00	49
1:00	43
2:00	38
3:00	38
4:00	50
5:00	51
6:00	50
7:00	48
8:00	57
9:00	55
10:00	60
11:00	55
12:00	56
13:00	55
14:00	50
15:00	55
16:00	55
17:00	61
18:00	55
19:00	53
20:00	52
21:00	56
22:00	49
23:00	44

The predominant noise source within the water treatment plant was from aircraft passing overhead. The water treatment plant machinery was inaudible at the proposed expansion site and at the water treatment plant property boundaries. State Route 125 traffic was barely perceptible at the northwest corner of the site. Other noise sources included birds chirping; occasional dog barks; distant construction equipment; and landscaping activities, e.g., leaf blowers and lawn mowers.

Noise measurements 1 through 6 and measurement 8 were taken on November 9, 2005, and measurement 7 was taken March 23, 2005. Noise measurement 1 represents the loudest individual pump motor at the sedimentation basins. Noise measurement 2 represents the average

operational noise of the filter and sedimentation machinery at a reference distance of 50 feet. It should be noted that the greatest noise source observed was rushing water moving through the treatment process. Noise measurements 3, 4, and 5 represent the property boundary daytime ambient noise level. Noise measurement 5, in the northwest portion of the property, is heavily influenced by construction activities on State Route 125, and without these activities it is likely ambient noise levels would be similar to noise measurements 3 and 4. Noise measurement 6 represents noise levels in the center of the site and in the habitat area. Noise measurement 7 represents noise levels generated by the backwash pumps. Noise measurement 8 represents typical daytime traffic noise levels along Lakeview Avenue. The 24-hour measurement was taken at the on-site air monitoring station and represents the ambient noise level conditions at the project site. The 24-hour measurement is consistent with the short-term measurements taken throughout the project site.

Noise Sensitive Land Uses

Single-family residences located north and northeast of the project site are the only noise sensitive land uses in the vicinity of the project.

Sensitive Species

Threatened or endangered bird species that are known to be affected by noise include California gnatcatcher and least Bell's vireo. Section 2.6, Biological Resources, of this EIR notes the locations of California gnatcatchers and least Bell's vireos that have been directly observed near the Perdue WTP. As a result, this analysis includes an assessment of potential noise impacts to this habitat area.

The primary concern related to noise and California gnatcatcher and least Bell's vireo is associated with activity during the breeding season. The California gnatcatcher is a year-round resident with potential breeding activity during the spring and summer (February 15 through August 30). The least Bell's vireo is a spring and summer breeding resident (March 1 through September 30), migrating south for fall and winter. Both birds primarily inhabit riparian woodlands, scrub, and thickets for breeding. Nest height is typically 3 feet above the ground.

USFWS and CDFG require limitation of noise levels to the habitats of threatened and endangered noise sensitive songbirds, such as the California gnatcatcher and least Bell's vireo, during their breeding seasons. However, no formal standards have been issued by these agencies. In San Diego County, the precedent set over many years is that noise levels generated

by a proposed project shall not exceed 60 dBA L_{eq} at the designated habitat or nesting site. Where the existing ambient noise level exceeds 60 dBA L_{eq}, the project noise level would be limited to less than or equal to the ambient noise level.

Vibration

Human and structural response to different vibration levels is influenced by a number of factors, including ground type, distance between source and receptor, duration, and the number of perceived vibration events. Groundborne vibrations can be interpreted as energy transmitted in waves through the soil mass. As the waves travel outward from a blast, they excite the particles of rock and soil through which they pass and cause them to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of the vibration amplitude, referred to as the peak particle velocity (PPV). Varying geology and distance will result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes will decrease with increasing distance, due to spreading of the energy and frictional losses. The energy transmitted through the ground as vibration, if great enough, can result in structural damage. Table 2.8 presents the vibration level thresholds for architectural and structural damage and human perception thresholds.

Table 2.8
General Human and Structural Response to Vibration

Effects on Structures and People	Peak Vibration Threshold (in/sec PPV)
Structural damage to commercial structures	6
Structural damage to residential buildings	2
Architectural damage	1.0
General threshold of human annoyance	0.1
General threshold of human perception	0.01

Source: Survey of Earth-borne Vibrations due to Highway Construction and Highway Traffic, Caltrans 1976.

As shown in Table 2.8, damage to structures occurs when vibration levels range from two to six in/sec. One-half of this minimum threshold, or one inch per second PPV, is considered a safe criterion that would protect against structural damage. California Department of Transportation (Caltrans) uses a vibration criterion of 0.2 in/sec PPV for its construction projects, except for pile driving and blasting. According to the Ground Vibration Monitoring for Construction Blasting

in Urban Area by Caltrans, the threshold for structure damage of two inches per second for structures beyond 115 feet or 35 meters from the blast location would be considered "safe" from any vibration-induced damage. This Caltrans criterion addresses the potential for human annoyance as well as structural damage.

Blasting creates seismic waves that radiate along the surface of the earth and downward into the earth. These surface waves can be felt as ground vibration. Airblast and ground vibration can result in effects ranging from annoyance of people to structure damage. Varying geology and distance will result in different vibration levels containing different frequencies and displacements. In all cases, vibration amplitudes will decrease with increasing distance.

Regulatory Setting

San Diego County General Plan. Policy 4b of the Noise Element of the General Plan (County of San Diego 1980) sets a standard for exterior noise levels at noise sensitive areas of 60 dBA CNEL. A noise sensitive area is defined as "the building site of any residence, hospital, school, library, or similar facility where quiet is an important attribute of the environment." If an acoustical study shows that noise levels would exceed the 60 dBA CNEL standard, then modifications should be made to the development to reduce the exterior noise level to 60 dBA CNEL or less. For the proposed project, this standard would relate to the permanent, operational noise generated by the Perdue WTP.

San Diego County Noise Ordinance. County Noise Ordinance Section 36.404 sets limits on the noise levels generated from one property to another, such as from mechanical equipment. Section 36.410 governs noise generated by construction activities. Section 36.404 sets the limit on noise generated on a property based on the 1-hour average sound level at any point on or beyond the boundaries of the property. This limit is shown in Table 2.9 and varies with the zoning of the properties concerned.

Section 36.410 also relates permitted noise levels to applicable hours; and includes provisions for noise source and receptor located in two different land use zones and for noise levels from public utilities. Regarding noise source and receptor in two different zones, Section 36.410 states, in part, "[t]he sound level limit at a location on a boundary between two (2) zoning districts is the arithmetic mean of the respective limits for the two districts…." Regarding public utilities and related transmission facilities, Section 63.410 states: "Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits of this section, measured at or beyond six (6) feet from the boundary of the easement

Table 2.9
County of San Diego Noise Ordinance Sound Level Limits

Zone	Applicable Hours	Sound Level Limit dB $L_{eq\ (1\ hour)}$
R-S, R-D, R-R, A-70, S-80, S-87, S-88, S-90, R-V and R-U Use Regulations with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45
R-RO, R-C, R-M, C-30, S-84, S-86, R-V and R-U Use Regulations with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50
S-94 and all other commercial zones.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55
M-50, M-52, M-54	Anytime	70
S-82, M-58, A-72 and all other industrial zones	Anytime	75

Source: County of San Diego Noise Ordinance, Section 36.404.

upon which the equipment is located." As the water treatment plant is zoned S-94 and is surrounded by residential land uses, the prima facie noise level limit at the treatment plant's property boundary is 55 dBA L_{eq} during daytime hours and 50 dBA L_{eq} during nighttime hours. However, as the project site and proposed improvements are related to a public utility, these noise level limits are applicable 6 feet beyond the boundary of the treatment plant property line. As shown in Table 2.7, the existing lowest ambient hourly noise level is below the County noise level limits, thus the County noise level limits will be used for evaluation of the project's noise impacts.

Section 36.410 of the County Noise Ordinance limits the hours of construction to between 7 a.m. and 7 p.m. and prohibits construction on Sundays and national holidays. Section 36.410(c) also limits construction noise, measured at or within any developed residential land, to a maximum of 75 dBA L_{eq} between the hours of 7 a.m. and 7 p.m.

2.3.2 Impacts

Construction Noise

Noise impacts from construction are a function of the noise generated by the construction equipment, the location and sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Noise levels within and adjacent to the project's construction sites would increase during the construction period.

In general, construction activities are carried out in phases and each phase has its own noise characteristics based on the mix of construction equipment in use. Typical maximum noise levels at a distance of 50 feet from the noise source for each of the major phases of construction are shown in Table 2.10.

Table 2.10
Typical Noise Level Ranges at Construction Sites

Construction Phase	Maximum Noise level at 50 feet - dBA	
	Minimum Required Equipment On-Site	All Pertinent Equipment On-Site
Clearing	83	83
Excavation	75	88
Foundation/Conditioning	81	81
Paving	65	81
Finishing and Cleanup	72	88

Source: Bolt, Beranek and Newman, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," prepared for USEPA, 1971.

Typical construction projects, with equipment moving from one point to another, work breaks and idle time, typically have louder short-term noise events, while long-term noise averages are lower. For analysis of this project, a maximum 1-hour average noise level of 75 dBA at a distance of 50 feet from the construction area is assumed to occur. Peak noise events may occur during trenching and excavation, when there may be a combination of noise from several pieces of equipment in proximity, including the noise of backup alarms. Noise levels of other activities, such as framing or concrete pours, would be less.

Noise levels from construction activities are typically considered as point sources and would drop off at a rate of 7.5 dB per doubling of distance over soft sites, such as grass fields and open terrain with vegetation. The area around the project site is acoustically soft and all potential receptors were assumed to be approximately five feet above grade or above the residence's finished floor elevation. All construction equipment is assumed to have an exhaust outlet height of 11 to 14 feet.

For the proposed Phase I improvements, demolition of the prefabricated building with concrete base (Butler Building) is anticipated to start in September 2006. Following this demolition, some explosive blasting would be required to prepare the proposed MFS site. Due to the unique characteristics of blasting impacts, they are discussed under a separate heading from typical construction. Grading and excavation would require three to four months. The majority of

debris and excavated soil would be retained on-site; however, it may be necessary to haul some debris away. It is assumed that, when debris hauling is necessary, a maximum of nine round trips per day in 20 cy dump trucks would be required. Construction of the concrete basins, operations office, restrooms, chemical storage facilities, and electrical and air compression facilities would occur through June 2009. During the building construction phase, paving and finishing of the access road would also occur. Approximately 0.7 acre is anticipated to be paved.

The nearest residential receptors to the project site are the single-family residences northeast of the project site, near measurement site 3 (see Figure 2.1), which is approximately 700 feet from the center of the potential construction area. Existing topography blocks the line of sight of the potential construction area to the nearest residence, which would reduce noise levels by 5 dB.

The proposed staging area would be located just northeast of the proposed expansion area, approximately 100 feet from the nearest residential property line. This area would be used to store construction material and equipment, perform routine equipment maintenance and cleanup, and as a management office location. Noise in this area would consist of equipment idling and occasional bangs and thuds from maintenance and material movement. Noise levels from the staging area would average 65 dBA L_{eq} at 50 feet from the center of the site, with occasional peaks on the order of 89 dBA.

Noise from demolition of the Butler Building would be made by jackhammers, dump trucks, backhoe, and other impact equipment for demolition. During demolition, peak noise levels can reach up to 60 dBA at a distance of 700 feet during operations of a dump truck, jackhammers, and a backhoe. Maximum noise levels would occur only sporadically since not all equipment would be operating at all times. Hourly average noise levels at the nearest residence during demolition would be anticipated to be below ambient (46 dBA L_{eq}), which would comply with the County Noise Ordinance.

Noise from general site preparation and grading would be made by dump trucks, backhoes, bulldozers and other heavy construction equipment. Maximum unshielded noise of a dump truck, a rock breaker, a bulldozer, and an excavator operating at the same time within the Phase I expansion site, could reach levels as high as 65 dBA. Maximum construction noise levels at the nearby residences would be heard above the existing noise levels and could create temporary annoyance; however, it should be noted that maximum noise levels would occur only sporadically since not all equipment would be operating at all times. The average hourly noise levels at the nearest property line with residential land uses would be similar to noise generated during demolition and would comply with the County Noise Ordinance.

The access road would be paved prior to completion of Phase I of the expansion project. Improvements would include widening and paving of the existing dirt road to prevent erosion and ensure adequate access. Grading of the road would generate the greatest noise levels. Grading equipment would likely include a bulldozer, a backhoe, and a scraper. Grading activities along the northern end of the roadway would generate peak noise levels on the order of 87 dBA, and average noise levels of 71 dBA L_{eq} at the nearest residential property line, approximately 75 feet away, which is below the 75 dBA average noise level between 7 a.m. and 7 p.m. as specified in the County Noise Ordinance.

The proposed expansion could also generate up to 15 daily round truck trips during peak construction activity, which would access the site via Swap Meet Road and Lakeview Avenue. It is estimated that this would result in a maximum of six additional trucks during peak traffic periods. As shown in noise measurement 8, the existing average daytime noise level along Lakeview Avenue is 54 dBA L_{eq}. The FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) and traffic counts provided by the site visit were used to develop predicted traffic noise levels. Traffic speeds and assumed vehicle classifications are based on site visit observations. The model was used to determine the noise level increase from the addition of six trucks to the traffic volumes observed during noise measurements. Based on the modeling results, the 6 additional trucks would increase traffic noise levels by 2 dBA L_{eq}. This would be a barely perceivable noise level increase and would not constitute a significant noise impact.

Blasting Noise

Blasting would be required as part of the construction process. All blasting would be contained subsurface and would be a controlled operation. The nearest residential receptors to the blasting activities, the single-family residences northeast of the project site, are approximately 700 feet to the center of the potential construction area. Topographic conditions block the line of sight of the potential construction area to the nearest resident, which would reduce noise levels by five dB. At a distance of 700 feet, maximum unshielded noise of blasting could reach levels as high as 63 dBA during maximum blasting activity, which is below the 75 dBA L_{eq} specified in the County Noise Ordinance.

Construction activities for the proposed Phase II improvements would be conducted in separate construction phases over an uncertain number of years. Estimates of emissions are anticipated to be similar or less than Phase I, depending on the location required for individual projects and whether they are farther in distance to sensitive receptors than Phase I construction.

Vibration

The most substantial vibration sources associated with the proposed project would be the construction equipment used during grading and preparation of the project site. The effect of construction vibration would depend upon the amount and type of construction planned under each phase, the distance between construction activities, and the nearest vibration-sensitive receptor. Table 2.10 shows the results of vibration measurements conducted by Wilson, Ihrigg & Associates during typical construction activities.

The vibration data provided in Table 2.11 indicate that construction equipment vibration levels are well below the 0.1 in/sec threshold of annoyance at distances ranging between 30 and 40 feet. No pile driving would be associated with the construction of the proposed project. However, blasting would occur during construction. According to Caltrans' threshold for structure damage of two inches per second (50 mm/sec.), structures beyond 115 feet or 35 meters from the blast location would be considered "safe" from any vibration-induced damage. The nearest residential structures are approximately 700 feet northeast of the project construction sites. Therefore, the vibration levels from construction activities would likely not be noticeable even for short periods. However, blasting would have a significant impact on noise sensitive bird species. During the breeding season, noise sensitive bird species would be potentially impacted by noise vibrations from blasting and would interfere with the breeding cycle of the California gnatcatcher and the least Bell's vireo. Mitigation measures for vibrations impacts during the breeding season would be required and have been included in the Biological Resources section of this EIR.

Table 2.11
Summary of Vibration Levels Measured During Construction Activities

Activity	Measured Peak Vibration Levels (in/sec PPV)
Moving CAT (Vibrator)	0.059 @ 42 ft.
Moving CAT (Backhoe)	0.043 @ 40 ft.
Earth Excavation	0.056 @ 42 ft.

Source: *Weekly Progress Report for Vibration Monitoring for Richmond Transport*, Wilson, Ihrigg & Associates, 1994-95

Sensitive Species Impacts

Measurement site 6 represents the ambient noise level in the habitat area. As the ambient noise level is 52 dBA L_{eq}, 60 dBA L_{eq} will be used to assess impacts to the habitat area. It is

anticipated that grading operations would generate the greatest noise levels. Average hourly noise levels within 50 feet of active construction sites could reach as high as 75 dBA L_{eq} and would exceed 60 dBA L_{eq} at distances up to 200 feet. Construction activities within the expansion site would be greater than 200 feet from the nearest point of the northern and eastern habitat area and activities in this location would not adversely impact the habitat area. The access road connecting the proposed expansion site to the proposed lay down area and the lay down area are adjacent (within 50 feet) to habitat areas. Traffic on the access road is unlikely to exceed the 60 dBA L_{eq} as the vehicles would represent transient noise sources that last only several seconds at any location in an hour.

As previously discussed, the staging area is anticipated to generate an average noise level of 65 dBA L_{eq} at 50 feet, and would require mitigation to avoid impacts to the habitat area immediately to the north. The most effective mitigation would be to erect an 8-foot-high temporary noise barrier along the northern edge of the staging area to block the line of sight between construction activities and the habitat or any nests within 80 feet. The barrier should be made of material with a weight of at least 3 pounds per square foot, such as ¾-inch thick plywood. The barrier should be solid from the ground to the top, with no gaps.

The proposed improvements to the access road would include grading and paving activities, which would occur within 50 feet of a habitat area. Thus, during the breeding season, noise sensitive bird species in these habitat areas could potentially be impacted by construction activities. As this type of work is linear and transient, it is usually infeasible to erect temporary barriers that would fragment the habitat. While avoidance of the breeding season for the road improvements would be the most effective mitigation, this may not be feasible and temporary impacts may occur.

Mitigation for temporary construction-related noise impacts to sensitive species is further addressed in Section 2.6, Biological Resources, of this EIR and mitigation through an adaptive monitoring program is provided in Biological Resources mitigation measure 11.

Operation-Related Impacts

The proposed improvements would create new noise sources in areas where none currently exist. From an acoustical perspective, operational noise from the proposed MFS improvements would essentially replace noise from the existing filter basins. The loudest activity associated with the existing equipment is the filter backwash. Backwashing is used to clean the filters and occurs an average of once per day per filter. The current process requires approximately 20 minutes per

operation. The proposed improvements would require 5 minutes to complete the same process. As the backwash operation nears completion, two 50-horsepower electric motors would pump water from the reservoir to a storage tank located above the existing facilities. The existing pumps are located along the northern edge of the existing clearwell. The proposed improvements would relocate the pump motors adjacent to the proposed MFS filters (see location on Figures 1.9 and 1.11). The proposed pumps would be slightly larger than the existing pump motors but would generate similar noise levels as the existing pump motors. Measurements of the existing pump motors located at noise measurement site 7 on Figure 2.1, indicate the pump motors generated approximately 55 dBA L_{eq} at 125 feet. The nearest point to the residential property line from the nearest point of the MFS site would be approximately 600 feet. Noise generated by these pump motors at the property line would be approximately 41 dBA L_{eq}. All other pump motors and fans would be housed inside a structure and would not generate a substantial amount of exterior noise.

In addition to these noise sources, the proposed project would include a new 500 kilowatt emergency generator. The generator would be housed inside an environmental enclosure that would reduce noise to 13 dBA at 50 feet. The generator would not operate continuously and would only be used when the local power supply is interrupted. Normal operation would involve starting the generator once a week for approximately 15 minutes for maintenance and reliability testing. Operating 15 minutes out of an hour, without an enclosure, a generator of this size would produce noise levels on the order of 75 dBA L_{eq} at 50 feet. With the noise enclosure, the generator would produce a noise level of 40 dBA L_{eq} at the nearest residential property line, which would be below the County's noise level limit. Thus, operational noise impacts that would result from the project are anticipated to be minimal.

Lakeview Avenue provides the only direct access to the project site and thus would, at some point, carry all the traffic for operation of the new project facilities. The proposed project operations would add approximately one new truck round trip per day to local streets. As shown in noise measurement 8, the existing average daytime noise level along Lakeview Avenue is 54 dBA L_{eq}. The noise impact on one additional round trip per day would be a barely perceivable noise level increase and would not constitute a significant noise impact.

2.3.3 Significance of Impacts

As shown in the preceding analysis, neither construction nor operation of the proposed project would result in a violation of the County Noise Ordinance. However, construction noise levels, affecting sensitive species such as the California gnatcatcher and least Bell's vireo would exceed

60 dBA L_{eq} at adjacent habitat or nesting sites. Mitigation measures in the Biological Resources section of this EIR would reduce this impact to a less than significant level.

2.3.4 Mitigation Measures

Construction Impacts

No construction-related noise impacts to human sensitive receptors were determined in the preceding analysis. As a result, no mitigation other than compliance with the County Noise Ordinance is recommended to protect human receptors from construction-related noise.

Sensitive Species Receptors

Mitigation measures for the potential impacts of increased noise levels during construction are listed in Biological Resources, Section 2.6.4.

2.4 LAND USE AND PLANNING

2.4.1 Existing Conditions

The proposed Phase I and Phase II improvements to the Perdue WTP would occur within the existing treatment plant site. In addition to the water treatment facilities at the site, most other adjacent lands are natural open space areas. Minor incidental uses on the Authority property in proximity to the treatment plant include a telecommunications antenna and an air quality monitoring station.

Surrounding Land Use

Adjacent to the north of the Perdue WTP is the urbanized community of Spring Valley, consisting primarily of single-family residences along the common property boundary of the Authority land. Along the route to the Perdue WTP, in addition to single-family homes, are a swap meet site that is operated on weekends, and an automobile repair business. To the west of the project site is Sweetwater Dam, Sweetwater River, and SR 125, which is approximately 1,900 feet to the west and is visible from the project site.

San Diego County General Plan

The project site is within the Sweetwater Community Plan, which is a portion of the San Diego County General Plan, and extends south from the project site to include the south half of the Reservoir and the southerly portion of Authority lands. East of the Perdue WTP, the north half of the Reservoir, and other Authority lands are within the Spring Valley Community Plan. Both community plans designate Authority lands as "Impact Sensitive Area," which "is applied to areas considered unsuitable for urban development for reasons of public safety or environmental sensitivity" (County of San Diego 1995). This same designation continues to the west along Sweetwater River. The adjacent properties to the north are within the Spring Valley Community Plan and are designated "Residential" with a maximum density of 7.3 dwelling units per acre.

The County is currently conducting a comprehensive update of its entire General Plan, a study known as General Plan 2020, and will include updates to each of the County's community plans and an EIR. The draft Sweetwater and Spring Valley Community Plans propose to designate Authority Lands as "Open Space (Conservation)." The draft description of this category states that it "is primarily applied to areas for the purpose of preserving natural, scenic and cultural resources and for protecting public health, safety and general welfare. This designation could

also be applied to land owned by conservancy groups or land dedicated as open space preserves. This designation allows uses such as habitat preserves, passive recreation, lakes and reservoirs. Grazing and other uses or structures ancillary to the open space purpose may be permitted if they do not substantially alter protected resources or the character of the area" (County of San Diego, n.d.).

Joint Water Agency NCCP

Expansion of the Perdue WTP is included as a covered project in the Authority's JWA NCCP Subarea Plan, as described in Section 1.5.2. This coverage provides take authorizations for covered species and their habitats. In the event the JWA NCCP plan is not approved by the wildlife agencies before site clearing for the project is required, clearing may be authorized through the "4(d) rule" associated with the state and federal listing of the California gnatcatcher as a threatened species. This rule allows taking of up to 5 percent of coastal sage scrub, that meets certain criteria for an agency actively preparing an NCCP Subarea Plan and has a Planning Agreement with CDFG. Additional discussion of the NCCP process and criteria for habitat take, is provided in sections 1.5.2 and 2.6.4 of this EIR.

2.4.2 Impacts

The proposed Phase I and Phase II improvements would be focused within and adjacent to existing treatment plant facilities. These improvements are consistent with the long-term use of the project site as a water treatment plant and are required for compliance with federal and state drinking water standards. The proposed project has been evaluated with regard to potential air quality and noise impacts that could adversely affect residential land uses on adjacent property. Measures to minimize the nuisance of fugitive dust during site grading have been included in Section 2.2.4 of this EIR. Predicted construction noise would be within the limits prescribed by the County Noise Ordinance. Based on these determinations, the temporary nature of the construction project, and the absence of other potential significant impacts on adjacent residential land uses from the proposed project improvements, potential land use impacts are considered to be less than significant.

The continued use of the project site for a water treatment plant and the necessary improvements to comply with federal and state drinking water standards would not be inconsistent with the County General Plan or the Sweetwater and Spring Valley community plans. In accordance with the "Impact Sensitive" land use designation of the Sweetwater Community Plan, the Authority provides security for limited and controlled public access to the Perdue WTP site, the

Sweetwater Reservoir, and areas of sensitive biological habitat. This security is needed for protection of public health and safety and for environmental resource protection. In addition, the vast majority of the Authority's ownership would remain as a water reservoir and open space lands that provide opportunities for public recreation. This open space character of the Authority lands would not be significantly impacted by the proposed project and existing natural habitat areas would not be significantly reduced.

The Authority's participation in the NCCP process and existing regulations and procedures for habitat protection described in Section 1.5.2 of this EIR, ensure that the proposed project would be reviewed for consistency with MSCP habitat planning efforts in southern San Diego County. The Authority would comply with the procedures and terms established by state and federal agencies to minimize impacts on sensitive species and habitats in a manner that also accommodates the needs for urban development and economic growth in the Authority's service area.

2.4.3 Significance of Impacts

Land Use and Planning impacts would be less than significant.

2.4.4 Mitigation Measures

Mitigation measures for impacts pursuant to the NCCP process are contained in Section 2.6, Biological Resources, of this EIR.

2.5 AESTHETICS AND VISUAL RESOURCES

2.5.1 Existing Conditions

The project site is located adjacent to the northwestern corner of Sweetwater Reservoir, near Sweetwater Dam. As can be seen in Figure 1.7, residences are located immediately adjacent to the north boundary of the Perdue WTP site. These residences are on Corte Quezada, Corte Pozos, Jaime Court, Colbert Drive, Arran Avenue, Ranza Road, and Spring Canyon Drive. Residences along the south side, and at the east end, of Corte Quezada are up to 25 feet above the adjacent portion of the Perdue WTP property at elevations of approximately 285 feet AMSL. Residences at the west end of Corte Quezada are at the same approximate grade as the adjacent portion of the Perdue WTP property at elevation 290 feet AMSL. Residences at the west end of Corte Pozos are at a slightly lower elevation than the adjacent portion of the Perdue WTP property. Residences along Jaime Court are at elevation 320 to 325 feet AMSL, which is similar to the adjacent portion of the Perdue WTP property. Residences along Colbert Drive are at elevation 330 feet AMSL, which is up to 10 feet above the adjacent portion of the Perdue WTP property. Residences on Arran Avenue and Ranza Road are at similar elevations as the adjacent portion of the Perdue WTP property. Residences on Spring Canyon Drive are at a lower elevation and do not have views of the project site.

Views of the Perdue WTP property are attainable from some of these residential areas, including views of existing accessory buildings and equipment storage areas, though mature residential landscaping and natural vegetation obscures views from most of these residences. In addition, due to the sloping topography, the existing views from many of these residences, in particular those west of Lakeview Avenue, do not show the Perdue WTP facility or the proposed MFS site, which are much lower at elevations of 270 to 285 feet AMSL. East of Lakeview Avenue, particularly at the east end of Corte Quezada, homes are at elevations 287 to 291 feet AMSL, from which the proposed MFS facility may be partially visible. However, the visual orientation of most of these homes is to the south directly toward Sweetwater Reservoir, rather than toward the Perdue WTP facilities, which are to the southwest.

Across Sweetwater Reservoir to the south and southeast, are the County Summit Park, the Sweetwater Fishing Recreation Area, and public trails that are approximately 0.7 mile from the project site. More distant views are available from residential areas adjacent to San Miguel Road and from the San Miguel Ranch development under construction approximately one mile to the southeast; and from ridgeline homesites over 2 miles to the southeast and northeast. The project

site may also be visible from portions of the future State Route 125, 1 mile or more to the southeast.

The appearance of the Perdue WTP when viewed from off-site areas is characterized by mostly low-rise public utility structures. Many of the structures are of red brick or masonry construction with simulated red tile roofs. The most prominent vertical features are the pair of circular washwater storage tanks in the western portion of the site. The existing clearwell extends a horizontal distance of approximately 300 feet but is only 4 feet above ground. The existing topography rises along the north side of the Perdue WTP facilities, as well as along the south, west, and east sides of the Reservoir, such that structures are not silhouetted against the horizon when viewed from off-site areas. The overall view, particularly from viewpoints to the south is predominantly of naturally vegetated slopes and Sweetwater Reservoir, with the Perdue WTP being a relatively minor element of the overall viewshed.

2.5.2 Impacts

Phase I

Figures 2.2 and 2.3 are photographs of the proposed membrane facility site. Removal of the Butler Building shown in Figure 2.2, will be required to construct the MFS facility. From the nearby residential areas, the most visible feature of the proposed project would be the temporary equipment staging and storage area shown in Figure 1.9. Materials, equipment, and contractor parking may also occur on a temporary basis in other areas labeled in Figure 1.10 as "Existing facilities or actively managed areas," including in the northwest corner of the Perdue WTP site. These types of storage and construction management activities have been customary, occasional uses within the Perdue WTP property since 1960, prior to any adjacent development, and would continue to be used for these purposes for the foreseeable future. Use of these staging and storage areas, while visible from off-site residences, would not block or substantially interfere with any scenic viewpoints that do not currently contain views of existing elements of the Perdue WTP facilities. Due to the topographic change within the project site, very few adjacent homes have short range views of Sweetwater Reservoir, instead most have more distant views of the Reservoir and of the hills and ridgelines to the south and east.

The proposed MFS facility would be constructed with a floor elevation at approximately elevation 270 AMSL and the upper pitch of the roof over a portion of the facility would be at elevation 307 AMSL. Views of the proposed MFS facility from the nearby residences would be limited to only the roof structure. The basins would not be visible as they would be built into the

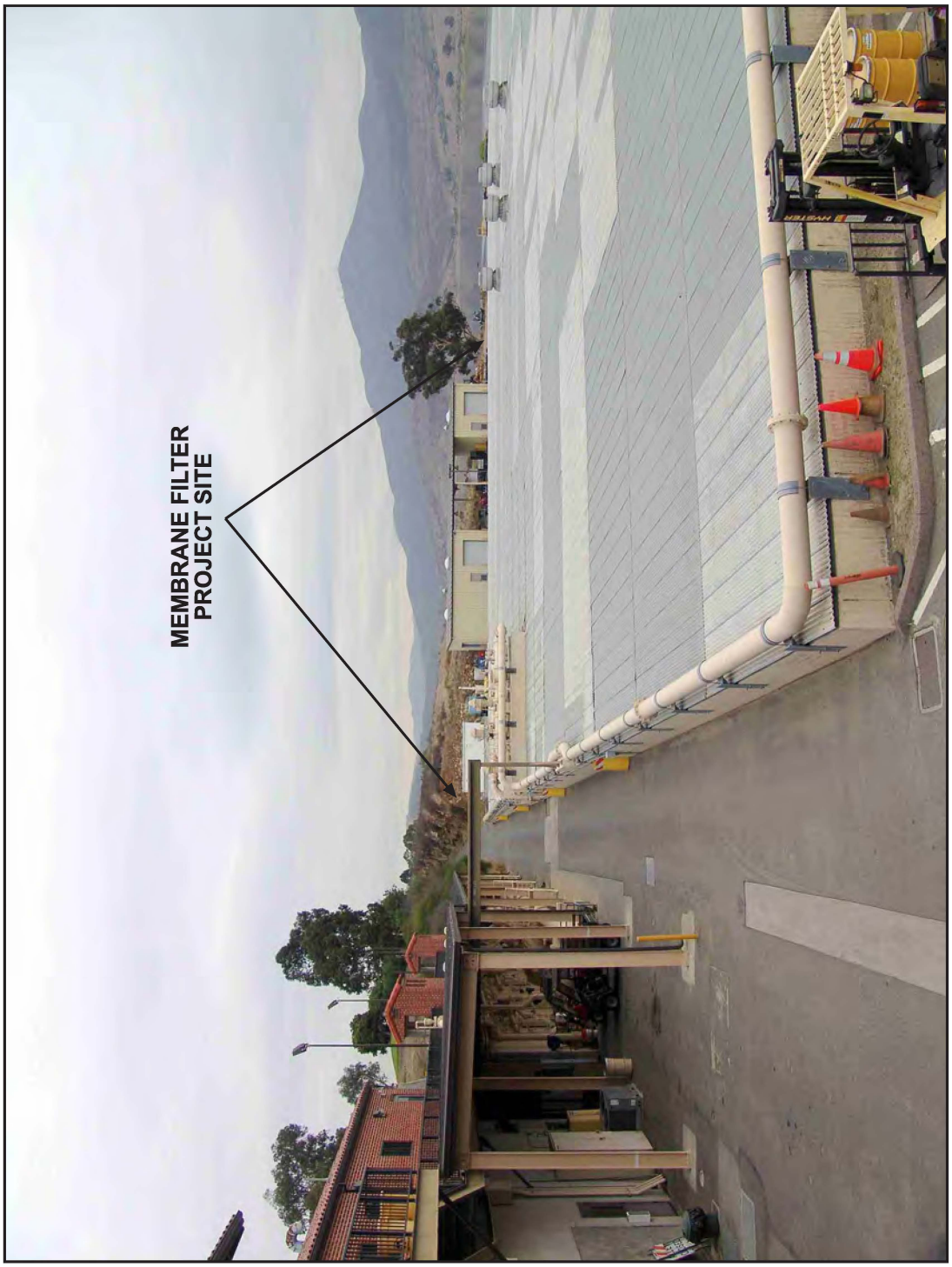

Figure 2.2
Membrane Site Viewed from West

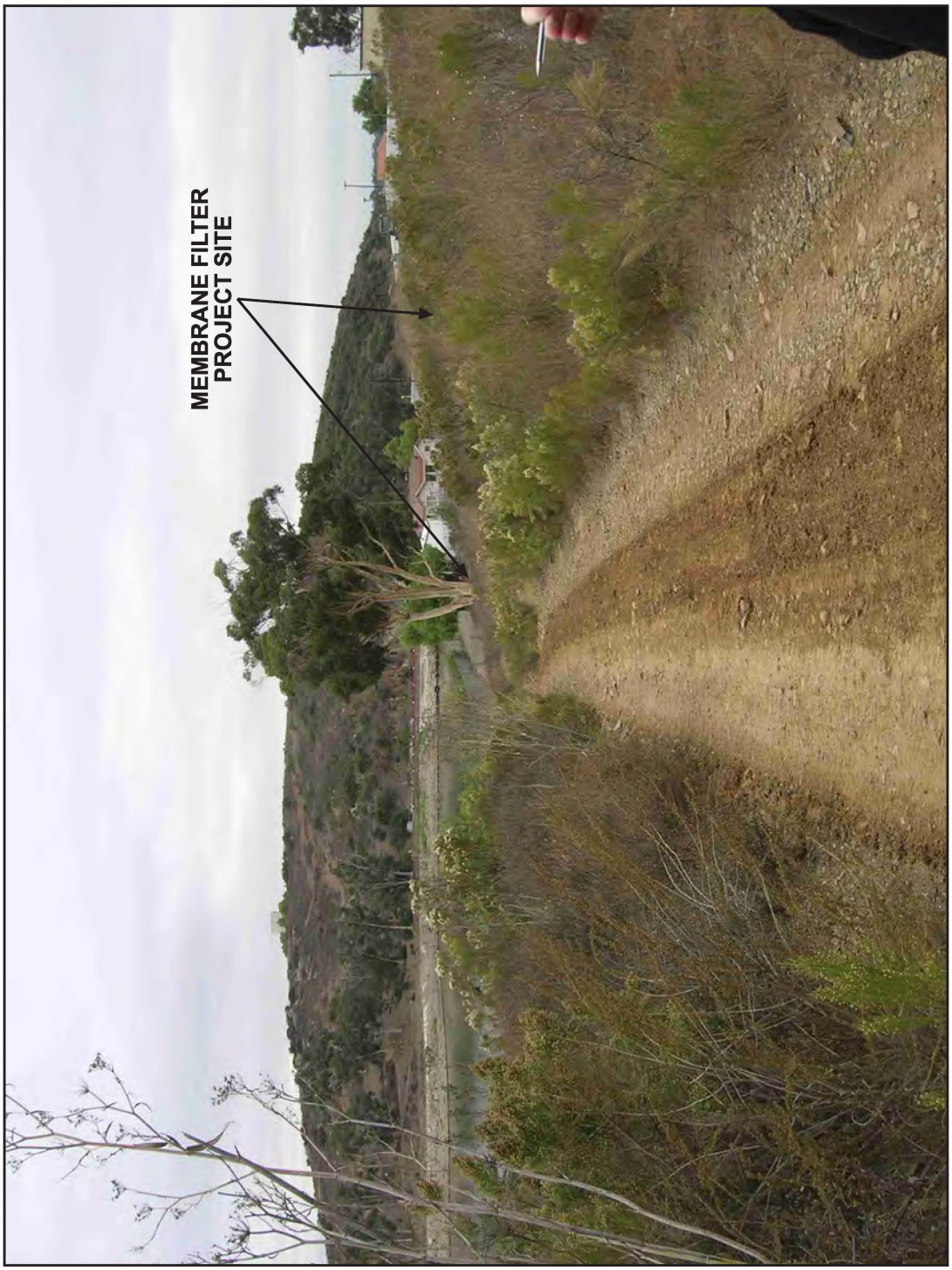

Figure 2.3
Membrane Site Viewed from Northeast

hillside. This would be at a minimum distance of approximately 700 feet and would occupy only a very limited portion of the expansive, open viewshed available from these residences. The Authority intends to use construction materials and colors that are consistent with the existing architectural character of other buildings at the facility.

Phase II

As with Phase I, project visual impacts would include construction staging and storage areas and the new water treatment structures described in Section 1.3.2. No precise location for Phase II construction staging has been determined at this time. Most of the proposed Phase II improvements would be located within existing developed areas, such as within the footprint of the existing finished water clearwell or by installing new water treatment processes within existing basins. The proposed hydroturbine facility would be installed in the western portion of the Perdue WTP site and would have very limited, if any, visibility from nearby residential areas.

2.5.3 Significance of Impacts

Changes in the visual character of an area that can be seen from residential areas, such as by establishment of equipment storage areas or construction of public facilities that are substantially different in scale, bulk, or appearance from residential structures, would be an adverse change in the visual character of the area. However, given the existing public utility character of the project site, the proposed temporary storage areas and permanent improvements would not have a significant environmental effect. The improvements would be contained within and adjacent to existing water treatment facilities and, thus, would not have a substantial adverse effect on a scenic vista. Nor would they substantially degrade the existing visual character or quality of the site and its surroundings. Furthermore, there are no unique scenic resources within the proposed development site that would be directly impacted by the proposed project.

2.5.4 Mitigation Measures

Although there would be no significant impact to aesthetics and visual resources, the Authority would incorporate the following measures into the project to minimize adverse temporary and permanent effects of the proposed Phase I and Phase II projects:

1. Exterior surfaces of proposed structures shall be finished in a manner that is similar to the existing Perdue WTP structures.

2. All existing landscaped areas that are removed for construction staging, storage, parking, or other temporary uses shall be restored to their preexisting or more improved landscape condition.

3. Native or non-invasive trees and shrubs shall be installed to reduce the apparent bulk and scale of new structures visible from off-site residential and public open space areas.

4. All new exterior lighting shall be fully shielded so that the light element is not visible from any adjacent residential or public open space areas.

2.6 BIOLOGICAL RESOURCES

The study area consists of approximately 70 acres in the westernmost portion of the reservoir property. The proposed project would be located adjacent to and within the existing Perdue water Treatment plant complex. Biological resource surveys were conducted February through September 2004 and March through June 2005. A biological technical report summarizing these surveys is provided in Appendix C. The following is a summary of that report as it relates to the proposed project.

2.6.1 Existing Conditions

Habitats/Vegetation Communities

Approximately 40 percent of the study area consists of natural vegetation communities, with the remainder occupied by the water treatment plant and associated facilities (see Figure 1.10). Coastal sage scrub (20.8 acres) occupies the majority of the natural vegetation communities, of the study area. The coastal sage scrub mapping unit includes a few isolated nonnative trees; open clay soils or clay lens habitat characterized by a mixture of native and nonnative grasses and forbs; as well as previously disturbed coastal sage scrub habitat that has recovered or is recovering,

Riparian woodland/scrub (2.1 acres) is located downstream of Sweetwater Dam, within the historic construction area of the Dam, and as such is physically and vegetatively disturbed.

Eucalyptus woodland (2.5 acres) occurs in concentrated patches along the western and southern portions of the survey area. The under story vegetation is generally comprised of non-native grasses and weedy species, but also contains some native shrub cover.

Disturbed or ruderal vegetation (2.4 acres) is found just west of Sweetwater Dam in areas disturbed during the Dam construction or subsequent improvements many years ago. Natural colonization has favored ruderal or weedy species versus native plant species, and as such, appear to have reached a climax vegetation community.

Developed area (26.5 acres) includes all existing treatment plant and Sweetwater Dam facilities, landscaping, and actively managed areas (e.g., firebreaks, or stockpile and staging areas). Open water reservoir (15.1 acres) occupies the remainder of the survey area and includes all areas up to the Reservoir high water mark (239-foot elevation contour). Vegetation is generally ruderal or

weedy species that is established during low water conditions but is either removed or inundated by periodic water level increases.

The biological surveys identified 192 plant species within the study area. Of these, 117 (61 percent) are species native to vegetation communities of southern California, and the remaining 75 species (39 percent) have been introduced, escaped, or have naturalized.

Wildlife Resources

Data compiled through ongoing observations on the Authority's Sweetwater Reservoir property and immediately adjacent lands includes 30 butterflies, 41 reptiles and amphibians, 243 birds, and 50 mammals. Many of these have been observed within the study area. At the time of the survey for the Perdue WTP project, 14 butterfly, 5 reptile and amphibian, 68 bird, and 6 mammal species were identified within the study area.

Sweetwater Reservoir lands include abundant and diverse wildlife including aquatic-associated avifauna such as grebes, herons, and ducks; raptors attracted by fish and avian species, and larger mammals such as mule deer, bobcat, and coyote. Reptiles and amphibians such as the western skink, orange-throated whiptail, southern pacific rattlesnake, and western toad have been observed within the reservoir lands, including the Perdue WTP compound.

Sensitive Resources

All native habitats occurring on-site are considered sensitive. Additionally, wetlands or identified state or federal jurisdictional waters are generally considered sensitive. Individual species are described as sensitive if they are state or federally listed as threatened or endangered or are candidates for listing; proposed for coverage in the JWA NCCP; listed on the California Native Plant Society's Inventory of Rare and Endangered Plants; or otherwise considered sensitive by local, state, or federal agencies. Figures 2.4 and 2.5 provide maps of sensitive species within the study area.

Coastal sage scrub is considered a sensitive plant community with 85 percent of coastal sage scrub in southern California already lost to urban/suburban and agricultural development. Remaining coastal sage scrub is generally isolated or fragmented. The on-site coastal sage scrub is contiguous with much larger areas of similar habitat on the Sweetwater Reservoir property, as well as the adjacent County park and the San Diego National Wildlife Refuge. Clay soils or clay

Source: Sweetwater Authority 2005

0 400 Feet

Figure 2.4
Sensitive Plant Species

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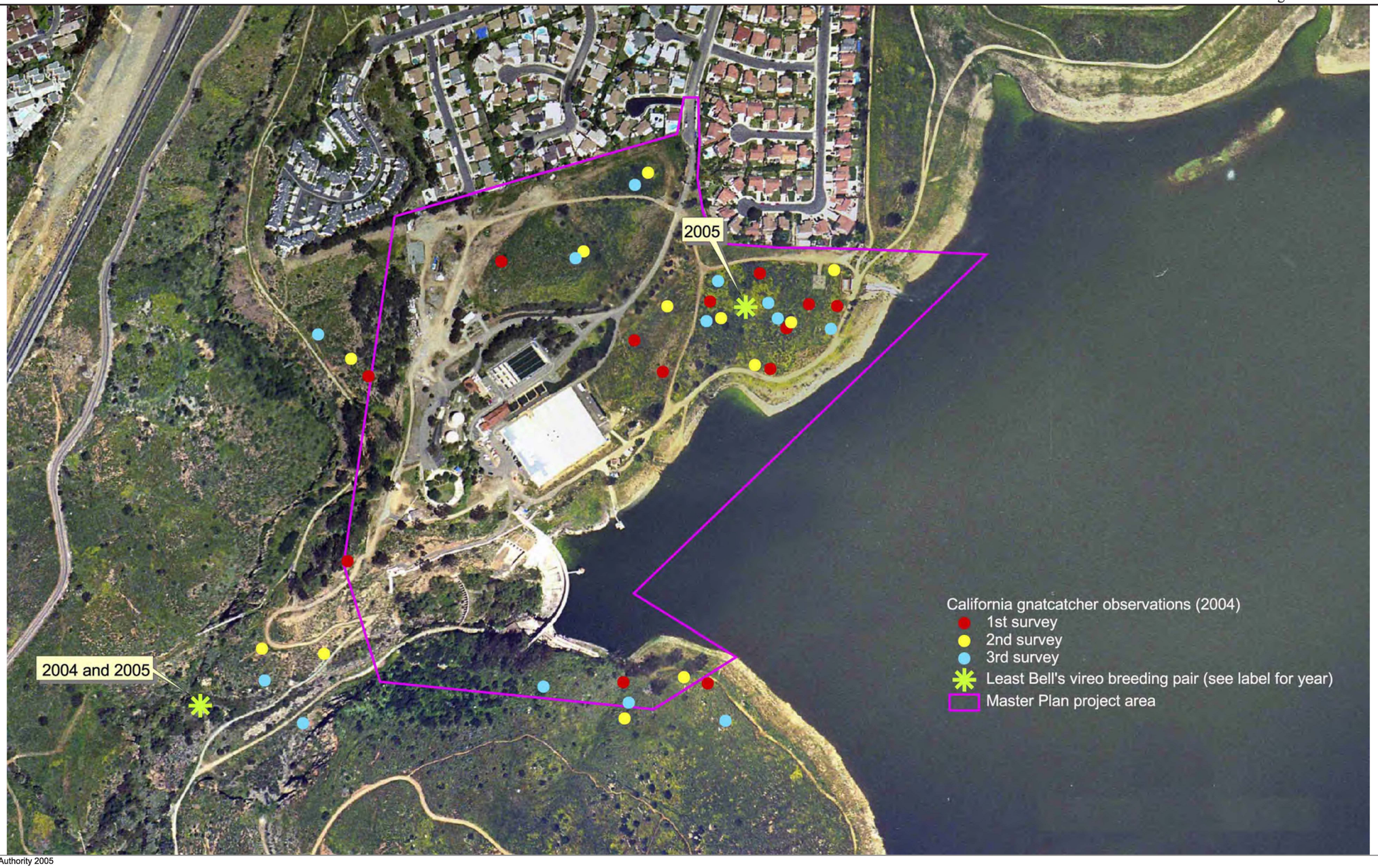

Source: Sweetwater Authority 2005

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Figure 2.5
California Gnatcatcher and Least Bell's Vireo Survey Information

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lens habitat identified within the coastal sage scrub plant community is also considered sensitive, since it has the potential to support various rare plant species.

Riparian scrub and woodland has also experienced significant declines in the southwest, with up to 95 percent of historic coverage lost due to agriculture, urbanization, flood control, lakes and reservoirs, and mineral extraction. Disturbed riparian woodland/scrub within the study area occurs immediately downstream of the Dam and is considered sensitive and of significant biological value.

Jurisdictional waters and associated wetlands are located within the riparian area downstream of the Dam as well as within the reservoir. As described in Section 1.5.2, USACE claims jurisdiction of wetlands up to the ordinary high water mark.

Sensitive Plant Species. No state or federally listed species detected within the study area, although four sensitive plant species were found. Twelve other sensitive plant species have the potential to occur in the study area. The majority of undeveloped areas within the study area have been designated as federal "critical habitat" for Otay tarplant.

Sensitive Wildlife Species. Twenty-four sensitive wildlife species were detected or are known to occur in the study area. Thirty other sensitive species have the potential to occur, but were not detected. The 5 sensitive wildlife species detected during the surveys or observed in the study area are listed as threatened or endangered by the state and/or federal resource agencies: California brown pelican (state and federal endangered), bald eagle (state endangered, federal threatened), peregrine falcon (de-listed federal endangered species, state endangered), California gnatcatcher (federal threatened, state Species of Special Concern), and least Bell's vireo (state and federal endangered). No Quino checkerspot butterflies were detected during focused surveys for the species, and the habitat was determined to have low potential for their presence.

California gnatcatcher is a year-round resident, generally found in coastal sage scrub. Between 11 and 13 pairs of California gnatcatchers were observed within or immediately adjacent to the project study area. The coastal sage scrub surrounding the Reservoir is proposed as federal critical habitat for the species. The riparian habitat in the upper portion of the Reservoir and the contiguous segment of Sweetwater River within the San Diego National Wildlife Refuge, contain substantial populations of least Bell's vireo and was designated as federal critical habitat for the least Bell's vireo in 1994. Riparian habitat downstream of the Sweetwater Dam is not designated as critical habitat, supporting no more than one pair of vireos since surveys began in

1992. A second breeding pair was detected within coastal sage scrub habitat immediately east of the Perdue WTP and within the study area.

Wildlife Corridors. Habitat connectivity is essential to maintaining long-term biological viability of natural open space. With human land uses encroaching into remaining natural lands, wildlife corridors have been cut off or minimized. Portions of the study area are considered important wildlife corridors, connecting to natural lands in the lower Sweetwater River valley and the San Diego National Wildlife Refuge.

Evaluation of Biological Resources

Sweetwater Reservoir and surrounding lands are considered a regionally important resource. The study area's direct connection to larger habitat areas adds to that value. Although the study area contains the Perdue WTP facilities and portions of the coastal sage scrub are disturbed, the high overall value of the habitat is demonstrated by the dense populations of California gnatcatchers and occurrence of least Bell's vireo.

2.6.2 Impacts

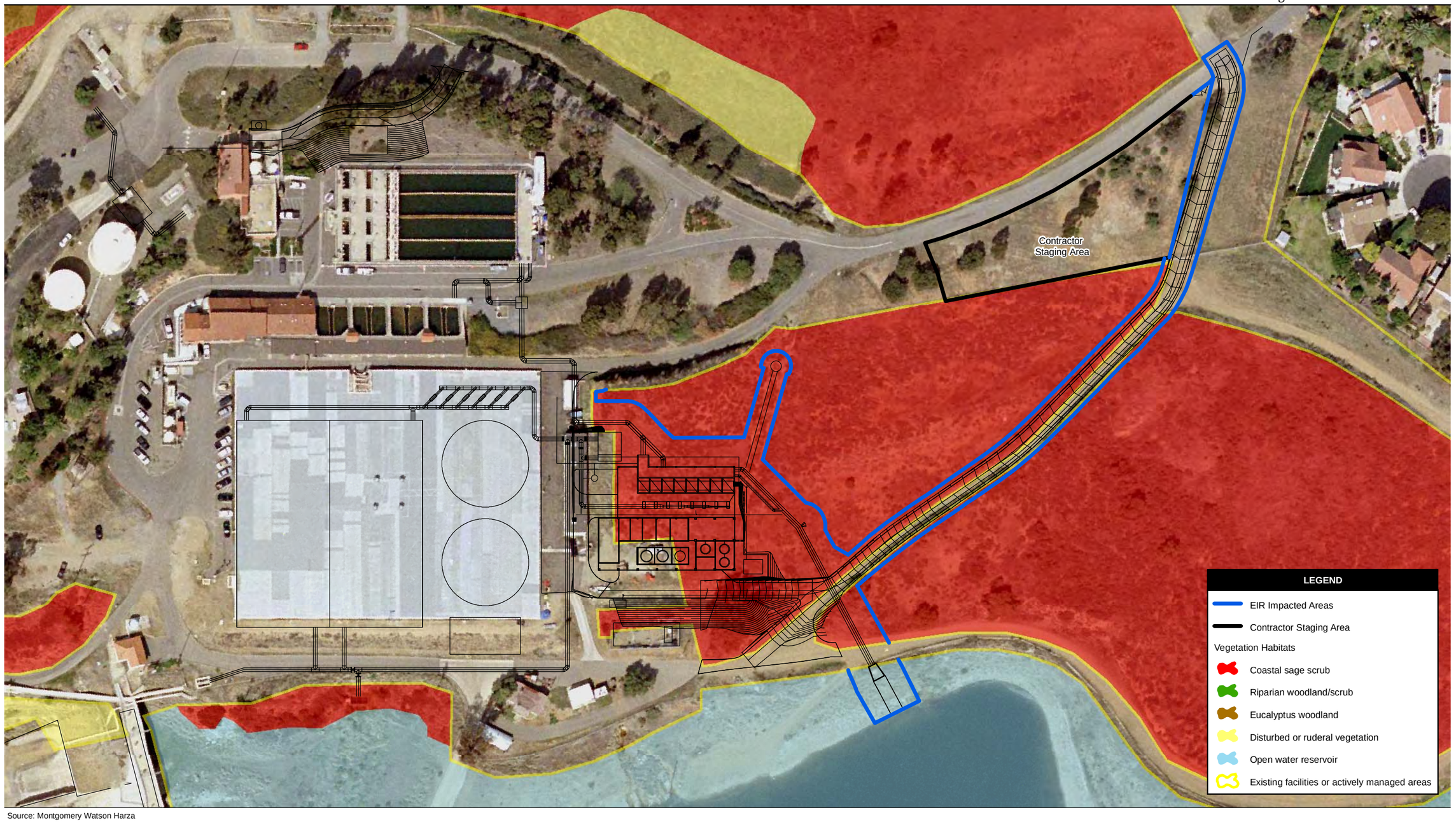
The proposed Master Plan improvements would be concentrated within and adjacent to the existing Perdue WTP compound. Direct impacts to sensitive biological resources are delineated on Figure 2.6. The project would impact only one vegetation community, coastal sage scrub.

Permanent Impacts

Loss of 1.19 acre of coastal sage scrub would result from the proposed MFS facilities and adjacent access road widening. Impacts to the open water reservoir would involve the placement of 0.02 acre of riprap below the Sweetwater Reservoir high water level.

Temporary Impacts

A total of 0.06 acre of coastal sage scrub would be temporarily impacted by installation of the proposed 24-inch gravity pipeline within a 20-foot-wide construction corridor between the proposed washwater tank and the MFS facilities. Construction of new drain lines to URDS and an existing outfall south of the clearwells would temporarily impact 0.05 acre of coastal sage scrub.



Source: Montgomery Watson Harza

100 50 0 100 Feet

Scale: 1: 1200; 1 inch = 100 feet

Figure 2.6
Project Impacts on Biological Resources

Path: P:\2004\4K004 R Perdue WTP MP Sweetwater Authority\5GIS\Mxd\fig 2.6 impacts on bio.mxd, 05/04/06, marraccinib

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Temporary Indirect Impacts

Coastal sage scrub habitat occupied by California gnatcatchers may be temporarily and indirectly impacted due to increased noise levels and blasting noise or vibrations generated during project construction.

The maximum acceptable noise level in California gnatcatcher and least Bell's vireo habitat occupied during the breeding season (February 15 through September 15), has been established at 60 dBA L_{eq}. It will be necessary to schedule construction during the breeding season and noise levels up to 88 dBA at 50 feet from the construction site (see Table 2.10 in Section 2.3) could occur.

Blasting would be accomplished by inserting charges within an excavated hole that is re-covered with excavated material that is expected to reduce the resulting blasting noise to below 60 dBA. However, vibration from the blasting could also have a significant impact on sensitive California gnatcatcher and the least Bell's vireo by interfering with their breeding cycle. Since blasting during the nesting season is unavoidable (McClelland 2006b), indirect impacts from blasting vibrations could occur.

Permanent Indirect Impacts

Vehicle traffic within the Perdue WTP is not expected to increase due to new deliveries or services (Thomson 2006) and should not create a significant impact to wildlife. Traffic would be restricted to existing or planned roads that are or will be posted at a 10-miles-per-hour speed limit. Increased noise during operation of the proposed MFS facility could increase noise levels in the adjacent coastal sage scrub habitat. Increased sedimentation and lighting could also result in indirect impacts.

2.6.3 Significance of Impacts

Direct impacts to 1.3 acres of coastal sage scrub and indirect impacts to the California gnatcatcher and least Bell's vireo, and indirect impacts due to increased noise, vibration, and dust during construction would be considered significant. However, implementation of the mitigation and monitoring program detailed below would mitigate impacts to below a level of significance.

2.6.4 Mitigation Measures

As described in Section 1.5.2 of this EIR, Sweetwater Authority is nearing completion of the JWA NCCP SAP, which will provide take authorizations for covered species and their habitats. Expansion of the Perdue WTP is included as a "covered" project in the draft SAP. At the time of preparation of this Draft EIR, the JWA NCCP had not yet been adopted by the various water agencies nor had a final Implementing Agreement been approved.

Compensatory mitigation described below assumes prior completion and adoption of the JWA NCCP. In the event this plan is not approved or implemented by the Sweetwater Authority or the wildlife agencies, the projects covered in the Master Plan will require prior approval of a habitat loss permit. The issuance of a habitat loss permit can be based on the authorization provided by the "4(d) rule" associated with the listing of the California gnatcatcher as a threatened species. This rule allows taking of up to five percent of the subregional plan area coastal sage scrub prior to plan approval, provided that the habitat loss would not preclude connectivity between areas of high habitat values, the habitat loss would not preclude or prevent the preparation of the subregional plan, and the habitat loss has been minimized and mitigated to the maximum extent practicable consistent with the proposed subregional plan. Through the 4(d) rule, the USFWS has determined that the loss of no more than five percent of the California gnatcatcher population would not jeopardize the continued existence of the species.

The following is a summary of mitigation measures that would be implemented to reduce the impacts of the project to below a level of significance. Details are provided in Appendix C.

Preconstruction Mitigation Measures

1. The project biologist shall consult USFWS in the year immediately prior to construction to determine if updated surveys for Quino checkerspot butterfly are necessary.

2. The project biologist shall ensure compliance with all biological project constraints. Duties shall include reviewing all grading and construction plans prior to commencement of grading or construction, providing a biological resources education program to construction managers and crew prior to any grading or construction, monitoring all phases of grading and construction, and assessing and coordinating any project area adjustments.

3. Temporary exclusionary fencing shall be installed at the project brushing limits and maintained to avoid accidental intrusions into adjoining sensitive habitats.

Mitigation Measures for Permanent and Temporary Coastal Sage Scrub Impacts

4. Impacts to coastal sage scrub shall be mitigated through the provision of replacement habitats as shown in Table 2.12. Replacement habitats shall contain similar species, in comparable concentrations, as those found in the project impact areas and shall be located in areas of larger connected open space within the proposed JWA NCCP conservation area. Replaced habitat shall be sited as close as possible to the project impact so as to maintain the overall biological integrity of the area. Replacement habitat shall exhibit characteristics or biological value equal to or greater than the habitat being lost. Replacement habitats shall be set aside within a conservation easement provided through the Sweetwater Authority SAP of the JWA NCCP. Initial oversight of the conservation area will be provided by the Sweetwater Authority biologist. The Implementing Agreement for the Sweetwater Authority SAP will provide the details of the required management of this and other conserved areas.

Table 2.12
Coastal Sage Scrub Mitigation

Type of Impact	Recommended Replacement Ratio	Phase I Impacts (acres)	Required Mitigation (acres)
Temporary Impacts	1:1	0.11	0.11
Permanent Impacts	2:1	1.19	2.38
Total Direct Impacts	--	1.30	2.49
Temporary Indirect Impacts	0.5:1	TBD*	TBD*

* To be determined based on adaptive monitoring program described in mitigation measure 11, below

The proposed JWA NCCP conservation easement area includes land within the Authority's Sweetwater Reservoir property, which lies adjacent to the USFWS San Diego National Wildlife Refuge – Otay-Sweetwater Unit. This connectivity to a permanent habitat preserve area provides greater habitat value and a more functional wildlife corridor and habitat linkage than that which would be removed by the project. The proposed JWA NCCP conservation area also provides for the preservation of a large, interconnected block of native habitat which exhibits an ability to support a high density of the California gnatcatcher and other target species. For these reasons, provision of replacement mitigation by the Sweetwater Authority within its proposed

JWA NCCP conservation area consistent with the proposed SAP would reduce impacts to coastal sage scrub habitat to a less than significant level.

5. Permanent preservation and management of the replacement habitat shall be assured to the satisfaction of the USFWS and CDFG by adoption of the Sweetwater Authority SAP pursuant to the JWA NCCP. This shall include designation of a conservation easement that is permanently protected by requirements specified in the Implementing Agreement for the Sweetwater Authority SAP. Alternatively, the USFWS and CDFG may authorize permanent preservation through an independent conservation easement granted to a public entity or non-profit corporation under terms satisfactory to USFWS and CDFG, which may include funding through an endowment account for maintenance and management of the conservation easement.

6. In occupied coastal sage scrub, brushing activities shall be conducted between September 1 and February 15 to avoid the California gnatcatcher nesting season. Where least Bell's vireo is determined to be present, removal of vegetation shall occur between October 1 and March 15.

7. Temporarily disturbed areas or manufactured slopes shall be revegetated with appropriate native species, as approved by the project biologist. Species selected will mimic those of the adjoining coastal sage scrub habitat and will be derived from local seed sources. Revegetated areas shall be monitored for a period of five (5) years, and any diseased or dead plants replaced as soon as feasible to ensure habitat success.

8. The placement of 0.02 acre of riprap below the high-water level of the reservoir would not impact wetland vegetation**,** however, application to the USACE shall be required for coverage under Nationwide Permit 7 for outfall structures and maintenance or Nationwide Permit 13 for bank stabilization. All permit requirements shall be implemented.

Mitigation Measures for Temporary Construction Noise Impacts

9. The project shall be evaluated for opportunities to schedule construction activities outside of the breeding season of the California gnatcatcher and least Bell's vireo. Construction shall be scheduled to avoid the breeding season to the maximum extent practicable.

10. Construction noise exceeding 60 dBA Leq shall be minimized or avoided to the maximum extent practicable during the respective bird nesting periods for California gnatcatcher and least Bell's vireo. Possible noise abatement techniques could include, but are not limited to, the use of sound blankets, and/or the installation of noise-reducing mufflers on equipment. For construction at the MFS facility site, sound barriers (e.g. walls) are not recommended in that habitat fragmentation could be more impactive than the noise levels.

11. When construction during the breeding season is unavoidable, an adaptive monitoring program shall be implemented with monitoring performed by a qualified biologist possessing necessary species monitoring permits or otherwise approved by the state and federal wildlife agencies:

    a) Active California gnatcatcher and least Bell's vireo territories within 500 feet of construction limits shall be identified no less than one month prior to construction activities and monitoring will continue thereafter through the nesting season or cessation of construction activities.

    b) Territories will be monitored at weekly intervals with a focus on identifying active nests. Any atypical territory displacement, evacuation, or nest failures as compared to a control site or other baseline will be attributed to the construction project, and mitigated as follows:

        - Subject to review of data and concurrence by the wildlife agencies, a zone of influence shall be delineated using territory mapping and nesting data and acres of indirect impact shall be assessed. Impacts shall be mitigated at a ratio of 0.5:1 within the JWA NCCP conservation area and covered by a permanent conservation easement.

        - Compensation for these temporary impacts is proposed at a reduced ratio since no physical habitat disturbance will occur and habitat will be available for species recolonization and nesting once construction is complete.

Mitigation Measures for Construction Blasting

12. Impacts from blasting due to excessive noise, vibrations, or scattering of blast debris shall be minimized by implementing the following measures:

- A blasting test shall be performed outside the breeding season and blasting techniques adjusted to keep noise, vibration, and blast debris at a minimum.
- The project biologist shall monitor the blasting test and subsequent blasting activities to determine whether impacts to California gnatcatcher or least Bell's vireo result from the blasting.
- If impacts from the blasting activities are noted, the adaptive monitoring requirements of mitigation measure 11, above, shall be implemented.

Mitigation Measures for Permanent Indirect Impacts

13. An assessment of ambient noise generated from new treatment plant facilities (e.g., pumps, motors, etc.) shall be conducted to determine if new noise levels will exceed 60 dBA L_{eq} in the adjacent habitat for the California gnatcatcher and least Bell's vireo. If new ambient noise exceeds 60 dBA L_{eq}, noise reduction features shall be implemented to reduce noise below this threshold. If increased ambient noise levels are unavoidable, a zone of permanent indirect impacts shall be calculated and an acceptable mitigation ratio shall be negotiated with the wildlife agencies. Mitigation shall be provided through habitat preservation in the future JWA NCCP conservation area.

14. Any required nighttime lighting shall be shielded and directed away from adjacent habitat areas.

15. Water runoff and sedimentation into adjacent preserve areas shall be prevented through the implementation of BMPs as described in Section 2.1 of this EIR.

2.7 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

The information in this section is based upon the *Draft Cultural Resources Inventory for Sweetwater Authority* prepared by EDAW (2005) and included in this Draft EIR as Appendix D. This report documents the findings of a cultural resources survey of 45 acres that may be affected by the proposed project.

2.7.1 Existing Conditions

The project area is situated along the dividing line between the coastal plain and foothills of southern San Diego County, approximately seven miles from the Pacific Ocean. The project area is encompassed within a range known as the San Miguel Mountains. A series of east-west-trending drainages within this range drain into Sweetwater River, which flows generally southwest into the Pacific Ocean.

The project area lies within gently sloping terrain near Sweetwater Dam and the spillway. The archaeological survey was conducted in linear transects spaced 10 meters apart. No archaeological resources were found during the survey. The majority of the survey area has been disturbed by grading, the construction of adjacent buildings, or graded dirt or paved roads. The portions of the survey area along the main road leading into the filtration plant have been graded and landscaped with grass and ornamental trees. The overall ground surface visibility was good.

Prehistory

Prehistorically, the project vicinity was used extensively by the Kumeyaay people. The prehistoric cultural sequence in San Diego County is generally conceived as comprising three basic periods: the Paleoindian, dated between about 10,500 and 8,000 years ago and manifested by the artifacts of the San Dieguito complex; the Archaic, lasting from about 8,000 to 1,500 years ago and manifested by the cobble and core technology of the La Jollan and Pauma complexes; and the Late Prehistoric, lasting from about 1,500 years ago to historic contact, and marked by the appearance of ceramics, small arrow points, and cremation burial practices.

Paleoindian Period. The Paleoindian period in San Diego County is most closely associated with the San Dieguito complex. The basal assemblages that make up the San Dieguito complex are characterized by scraper planes, choppers, scraping tools, crescentics, elongated bifacial knives, and well-made leaf-shaped points. The best-dated and most thoroughly investigated San Dieguito component was found at the C.W. Harris site, located on a terrace overlooking the San

Dieguito River, approximately 35 miles north of the present project area. Here, distinctive San Dieguito materials were found stratigraphically below materials characteristic of the early and late Archaic, and dated to 9,000 years before present (B.P.). The San Dieguito complex is thought to represent an early emphasis on hunting for subsistence. Aside from the Harris site, however, well-dated San Dieguito assemblages are uncommon, and the relationship between the San Dieguito and the subsequent La Jolla pattern of the Archaic is far from clear.

Archaic Period. The economy of the Archaic period (8000 B.P. to 1500 B.P.) is usually conceived as having a more generalized subsistence pattern, possibly the result of environmental changes and population stress, with an emphasis on gathering shellfish, fish, and vegetal resources. This is indicated by the increased frequency of groundstone implements and the adoption of a mixed cobble/core-based tool assemblage, as well as heavy use of shellfish along the coast. The Archaic artifact assemblage of coastal San Diego County is known as the La Jolla complex.

Late Prehistoric Period. The Late Prehistoric period shows evidence of technological changes as evidenced by the appearance of small projectile points and ceramics. The small projectile points are thought to mark the introduction of bow-and-arrow technology into the region. Ceramics, typically consisting of Tizon brownware, may have been introduced slightly later than arrow points. These traits, together with the appearance of cremation burials, are thought to derive from desert areas to the east, either by population movement, diffusion, or a combination of both. Most settlement and subsistence data from San Diego County indicate that the Late Prehistoric economy was oriented primarily toward terrestrial habitats, as opposed to the more maritime focus of the Archaic.

The increasing diversification and intensification seen for the Late Prehistoric were likely a result of environmental change, siltation of lagoons, or population increases. In general, it is thought that there was increasing emphasis on plant collection and processing in the Late Prehistoric, as evidenced by abundant bedrock milling stations in the foothills and interior mountains.

The Late Prehistoric period is represented at sites in and around the Sweetwater River valley, where habitation sites have been located. Exploitation of the mesas and ridgelines is indicated by small arrow points and occasional ceramic sherds, but no Late Prehistoric period long-term habitation sites have been found there. It appears that the higher elevations were utilized by logistically organized groups operating out of habitation sites located in the river valley.

Ethnohistory

By the time Spanish colonists began to settle in California, the project area was within the territory of the Kumeyaay people, a group of intermarrying territorial bands, who spoke a Yuman language of the Hokan linguistic stock. The closely related Paipai inhabited northern Baja California, and the Takic-speaking Luiseño occupied a territory centered on the San Luis Rey River to the north. The Kumeyaay were the first Alta California Native American group to be brought into the Mission system, beginning in 1769, but they have maintained their cultural identity to a large degree. They are a federally recognized Indian tribe with active interest in the management of cultural resources. The Kumeyaay currently occupy a number of reservations in San Diego County, including Jamul, Campo, Sycuan, Viejas, Barona, Mesa Grande, and Santa Ysabel.

History of Project Area

The history of water service to the South Bay began in 1869 when the Kimball Brothers Water Company was formed, the first in a succession of privately owned water companies until 1977 when Sweetwater Authority was formed though a Joint Powers Agreement between the South Bay Irrigation District and National City. Sweetwater Reservoir was constructed in 1888 when the predominant use of water was for citrus irrigation and drinking water quality was not a major concern. Eventually homeowners became the largest group of customers for safe and reliable drinking water supply, and by 1961 the 25 mgd Sweetwater Filtration plant had been completed.

Resources Previously Identified within the Project Area

The 2003 records search conducted by ASM Affiliates and provided to EDAW identified 22 resources within 1 mile of the project area. However, none of these resources are located within or adjacent to the cultural resources survey area. The resources included 4 isolated finds; 15 archaeological sites, including lithic scatters, lithic and groundstone scatters, lithic and shell scatters, one lithic scatter with amethyst glass, bedrock milling, and one stacked rock hunting blind; and 3 structures or buildings, including Sweetwater Dam and associated structures, and the commissary building within the Perdue WTP complex.

2.7.2 Impacts

Based on information provided by the site records search and an on-site site survey, there are no known cultural resources located within or immediately adjacent to the area that would be

impacted by project construction or operations. Therefore, no impacts to historical or archaeological resources are anticipated with the proposed project.

2.7.3 Significance of Impacts

No known cultural resources were located within or adjacent to the project site. Appropriate action as a result of encountering a cultural resource during ground-disturbing construction activities would ensure that impacts to historical and archaeological resources would be less than significant.

2.7.4 Mitigation Measures

No known cultural resources were located within or adjacent to the project site. However, there may be potential to encounter cultural resources during ground-disturbing construction activities. If cultural resources are found during construction, work in that area should be temporarily halted, and the find assessed by a qualified archaeologist. If the find is determined to be eligible for the California Register, then a research design and data recovery program designed and implemented by a qualified archaeologist shall be prepared and carried out to reduce impacts to a less than significant level before ground-disturbing construction activities resume.

2.8 GEOLOGY AND SOILS

The information in this section is based upon *Draft Geotechnical Evaluation, Perdue Water Treatment Plant Modifications* prepared by Ninyo & Moore (2005). This report documents the geotechnical findings, conclusions, and recommendations regarding the proposed improvements and is included in this Draft EIR as Appendix E.

2.8.1 Existing Conditions

The project site consists of undeveloped areas covered with sparse shrubs and grasses, and the water treatment plant containing masonry brick buildings, subterranean concrete-lined tanks, above-grade steel tanks, and paved access roads. Uses in the surrounding area are generally residential and open space preserve. Elevations in the area of proposed project improvements range from approximately 250 feet to 285 feet AMSL.

Regional Geology

The project area is situated in the San Diego County section of the Peninsular Ranges Province. This province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California. The province varies in width from approximately 30 to 100 miles. In general, the province consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the Southern California Batholith. The portion of the province in San Diego County, in which the project area is situated, generally consists of uplifted hills and ridges of Cretaceous-age granitic rock.

The Peninsular Ranges Province is traversed by a group of subparallel faults and fault zones trending roughly northwest. Several of these faults are considered active faults. The Whittier-Elsinore, San Jacinto, and San Andreas faults are active fault systems located northeast of the project area; and the Agua Blanca-Coronado Bank, San Clemente, and Rose Canyon faults are active faults located west of the project area.

Site Geology

Geologic units located on the project site include fill, weathered volcanics, and Jurassic-age metavolcanic rock. General descriptions of these earth units are provided below. These soils are not classified as a corrosive site based upon applicable laboratory tests.

Fill. Fill consists of brown, damp, loose to dense, silty fine to medium sandy gravel with cobbles up to 8 inches in diameter.

Weathered Volcanics. Weathered volcanics are weathered metavolcanic rock and are yellowish to light brown, dry to moist, silty to clayey fine sand to gravel derived from intensely to moderately weathered volcanic rock.

Santiago Peak Volcanics. Metavolcanic rock of the Santiago Peak Volcanics underlies the project site. This metavolcanic rock is fresh to slightly weathered, very strong, hard, massive to jointed crystalline rock. The joint openings vary from very narrow (< 0.05 inch) to wide (> 0.5 inch) and sand and/or silt are found in some joint openings.

Faulting and Seismicity

Ground shaking as a result of earthquakes is a potential hazard throughout southern California. The relative potential for damage from this hazard is dependent upon the type, magnitude, and location of an earthquake event. Although the project site is located in the seismically active southern California region, there are no known active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years) or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 2,000,000 years) in the immediate project area. The Elsinore Fault has been mapped approximately 38 miles east of the site and the Rose Canyon Fault has been mapped approximately 8 miles west of the site.

In general, hazards associated with seismic activity include strong ground motion, ground surface rupture, lateral spread, liquefaction, seismically induced settlement, and tsunamis. Liquefaction, seismically induced settlement, lateral spread, and tsunamis are not considered design constraints on the project due to the site location, elevation, and underlying materials.

Landslides

No landslides or indications of deep-seated landsliding activity have been identified for the project area.

Groundwater

The groundwater table in the area is located below the depths of the proposed improvements.

2.8.2 Impacts

The following impacts would result with the implementation of the proposed project.

Site Geology

The project area is underlain by very hard metavolcanic rock. Excavations may not be possible with standard heavy duty earthmoving equipment and will necessitate the use of breakout equipment or blasting. In general, soil materials generated from the site excavations would not be suitable for reuse as backfill. Disposal or crushing of this material is anticipated.

Faulting and Seismicity

In general, hazards associated with seismic activity include strong ground motion, ground surface rupture, lateral spread, liquefaction, seismically induced settlement, and tsunamis. No known underlying active faults are located in the project area. Therefore, no impacts associated with ground surface rupture due to faulting are anticipated in the project area or to occur with implementation of the proposed project. Also, due to the site location, elevation, and underlying materials, no impacts associated with liquefaction, seismically induced settlement, lateral spread, and tsunamis are anticipated to occur with implementation of the proposed project.

Landslides

No landslides or indications of deep-seated landslide activity are identified for the project area and no impacts associated with landslides are anticipated to occur with implementation of the proposed project.

Groundwater

The groundwater table in the area is located below the depths of the proposed improvements and no impacts to groundwater are anticipated to occur with implementation of the proposed project. However, some localized seepage should be anticipated based on the topography and fractured characteristics of the underlying rock.

2.8.3 Significance of Impacts

The Ninyo & Moore report provides recommendations for earthwork activities and project design features to ensure that impacts to geology and soils would be less than significant. These recommendations have been incorporated in the following mitigation measures.

2.8.4 Mitigation Measures

Although the proposed project is not anticipated to result in significant impacts to geology and soils, specific recommendations for earthwork activities and project design features include, but are not limited to, the following to ensure that impacts to geology and soils would be less than significant.

1. Site Preparation. The project area shall be cleared and grubbed prior to grading. Clearing and grubbing shall consist of the removal of vegetation, asphaltic concrete, and other deleterious materials. Clearing and grubbing shall extend outside of the proposed excavation areas. The debris generated during clearing and grubbing shall be removed from areas to be graded and disposed of at a predetermined and legal location.

2. Temporary Excavations and Shoring. Trenches and excavations shall be designed and constructed in accordance with appropriate and applicable Occupational Safety and Health Administration (OSHA) regulations. These regulations provide trench sloping and shoring design parameters for trenches up to 20 feet deep based on the soil types encountered on the project site. Trenches over 20 feet deep shall be designed by the contractor's engineer based upon site-specific geotechnical analysis. Soil classifications and excavation activity shall be confirmed in the field by the Geotechnical Consultant in accordance with OSHA regulations.

3. Excavation Characteristics. Based upon the excavation characteristics of the on-site materials, excavation cannot be performed with conventional earthmoving equipment. The metavolcanic rock would require the use of heavy tipping or breakout equipment or blasting.

2.9 HAZARDS AND HAZARDOUS MATERIALS

The information in this section is based upon *Emergency Planning and Response for Sweetwater Authority* (Tracer 2004a) and *Operating Procedures for Sweetwater Authority* (Tracer 2004b) both prepared by Tracer Environmental Sciences and Technologies. These reports document the responsibilities for emergency events for Sweetwater Authority employees and associated tasks to be performed with respect to the operating procedures associated with the water treatment system. In addition, the *Master Plan for Future Plant Facilities* prepared by Montgomery Watson Harza (2003b) was also referenced in preparation of this section.

2.9.1 Existing Conditions

As discussed in Chapter 1.0 of this EIR, the existing chemical feed and storage facilities would require some modifications to support the proposed plant improvements, enhance plant operations, and maintain operational safety. All chemical storage would be within the existing chemical storage facilities or within the new MFS or other areas identified for chemical storage on Figure 1.9. A brief description of the following chemicals and the current and new expanded chemical feed systems are provided below.

- Ferric chloride ($FeCl_3$)
- Chlorine (Cl_2)
- Ammonium hydroxide (NH_4OH)
- Chlorine dioxide (ClO_2)
- Sodium chlorite ($NaClO_2$)
- Sodium hypochlorite (NaOCl)
- Ferrous chloride ($FeCl_2$)
- Caustic soda (sodium hydroxide) (NaOH)
- Powdered activated carbon (PAC)

Ferric chloride is used as a coagulant to help settle out particles in the water. This iron salt may cause irritation and may be harmful if swallowed. The existing $FeCl_3$ feed and storage facility includes one 10,000-gallon fiberglass storage tank and two chemical feeders capable of delivering a maximum feed rate of 150 gallons per hour. To improve coagulation, a second storage tank would be required. The existing ammonia hydroxide storage tank will be replaced with a 10-foot-diameter tank in the same footprint, providing an additional storage volume of 10,000 gallons. The existing ferric chloride chemical feeders would be replaced with new feeders sized for the dosage needed for the maximum planned treated water production rate.

Chlorine is the most acutely hazardous material at the plant. It is toxic, corrosive, and reactive. Chlorine is a strong oxidizing agent that can react violently with a variety of chemicals. Chlorine has a strong irritating odor that alerts a person to its presence at a concentration well

below its toxicity level. Although chlorine is hazardous, it is an important and commonly used chemical for disinfection, bleaching, and the manufacture of many industrial and consumer products. It will be used at the plant in conjunction with sodium chlorite to form chlorine dioxide, which will be used as the primary disinfectant in the water.

Ammonium hydroxide (ammonia) has been used on the site since 1990, in conjunction with chlorine, for final disinfection of the treated water. The proposed project would include relocating the existing ammonia storage tank to the new membrane facility.

Ammonia and chlorine or sodium hypochlorite combine to form chloramines. The chloramines are used as a secondary disinfectant to maintain a proper level of disinfectant residual throughout the water distribution system. They do not degrade as rapidly as free chlorine and, unlike free chlorine, do not form disinfectant byproducts (trihalomethanes or haloacetic acids), that are regulated by the USEPA.

Ammonium hydroxide can cause irritation to skin, eyes, and the respiratory tract and may be harmful if swallowed. Ammonia is considered a hazardous material based on its toxicity; however, it is less toxic than chlorine or ozone and is not considered a fire hazard, but it may explode if mixed with oxidizers. Ammonia has a strong irritating odor that alerts people to its presence at a concentrations well below its "immediately dangerous to life and health" (IDLH) level.

As a primary disinfectant, chlorine dioxide is considered a viable alternative for reducing DBPs associated with the use of chlorine in meeting current and proposed DBP regulations. As a pre-oxidant, chlorine dioxide has been shown to be effective in limiting the formation of DBPs and controlling taste and odor and will be used on-site. The Perdue WTP currently uses chlorine dioxide as a pre-oxidant and primary disinfectant, added before coagulation, flocculation, and sedimentation. Chlorine dioxide has some or all of the following benefits:

- Oxidation of some taste- and odor-causing compounds
- Oxidation of iron and manganese
- Reduction of algae in the flocculation and sedimentation basins
- Elimination of color associated with the use of potassium permanganate
- Improvement in filter performance by reducing manganese loading caused by the use of potassium permanganate
- Reduction of chlorine demand and DBP formation potential

Sodium chlorite is used as a precursor in the generation of chlorine dioxide. The sodium chlorite is mixed with chlorine to create chlorine dioxide. No changes are anticipated in the bulk storage of sodium chlorite for this project.

Sodium hypochlorite would supplement the use of gaseous chlorine. Although chlorine gas is still necessary to the production of chlorine dioxide, sodium hypochlorite can be used with ammonium hydroxide to form chloramine. The primary reason for considering the change from chlorine gas to sodium hypochlorite is safety. The hazards from exposure to chlorine vapor and/or liquid are well documented.

Ferrous chloride will remain in its existing on-site location. It is used to reduce and control chlorite levels when treating water with chlorine dioxide. Chlorite is a byproduct of chlorine dioxide disinfection and the levels allowed in drinking water are regulated by the USEPA. Ferrous chloride reacts with the chlorite, reducing the chlorite to chloride, a common constituent in drinking water. The ferrous chloride is in turn, oxidized to ferric chloride and allows the reduction of ferric chloride dosages as the primary coagulant.

Caustic soda (sodium hydroxide) is a caustic compound that attacks organic matter. It is available commercially in various white solid forms and as a solution of various concentrations in water. Sodium hydroxide is very soluble in water, alcohol, and glycerin and absorbs carbon dioxide and moisture from the air. Sodium hydroxide provides for hydrolysis and condensation as well as functioning as a neutralizing agent for acids. Sodium hydroxide is used to adjust the alkalinity of the drinking water, thus making it more stable and less corrosive.

The two existing 4,000-gallon caustic soda tanks will be abandoned, and two new 6,000-gallon storage tanks and associated feed equipment will be included in the new membrane facility.

Powdered Activated Carbon is a powder used for taste and odor control in the water treatment process. PAC can be applied directly to existing flocculent tanks at a prescribed rate to achieve the level of removal of taste, odor, and toxins as required. Following the application of PAC, the activated carbon is removed as part of the flocculation process, or subsequently filtered mechanically.

The plant improvements include a new PAC storage and feed system designed to handle 40,000 pounds of PAC. The PAC will be fed at a constant low level feed rate that will be ramped up to much higher feed rates required during severe taste and odor events.

The following chemicals are delivered to Perdue WTP as needed, with an average of one delivery every other day.

- Ferric chloride ($FeCl_3$)
- Chlorine (Cl_2)
- Ammonium hydroxide (NH_4OH)
- Chlorine dioxide (ClO_2)
- Sodium chlorite ($NaClO_2$)
- Sodium hypochlorite (NaOCl)
- Ferrous chloride ($FeCl_2$)
- Caustic soda (sodium hydroxide) (NaOH)
- Powdered activated carbon (PAC)

2.9.2 Impacts

Construction Impacts

Construction activities may create potential significant impacts to the safety of project workers and the public. To avoid such hazards, a construction plan would be prepared to ensure appropriately safe conditions. Impacts associated with construction activities would be less than significant. Due to storage, handling, and use of chemicals in the water treatment process, hazardous materials residue may be encountered during excavation and construction activities. If discolored soil or other potential hazardous materials issues are encountered during these activities, site-specific environmental investigation and/or mitigation may be required by regulatory agencies.

Operational Impacts

The proposed project would no longer use chlorine gas and potassium permanganate in the water treatment process. Although chlorine would still be used to generate chlorine dioxide, impacts associated with operation of the water treatment facilities and the handling and storage of chemicals would be less than significant with appropriate procedures having been established at Perdue WTP for chemical delivery, storage, and handling.

All chemicals would be delivered to the site via truck and stored within the existing chemical storage facilities or within the new MFS building or other sites identified for chemical storage on Figure 1.9. Operational measures have been developed by the Authority to store, treat, and dispose of chemicals as well as for responding to spills, leaks, and any other accidental releases. Proper and appropriate chemical storage and the storage, treatment, and disposal of sludge material would also occur for the Phase II project components and operations.

Ferric deliveries would need to be made approximately once every 5 days during maximum plant water treatment flow.

Up to 20,000 gallons of 19-percent-strength ammonium hydroxide would be stored at the Perdue WTP (42,000 pounds), with an average and maximum daily usage of 1,400 pounds and 2,250 pounds, respectively. The ammonia storage and handling system would include two 6,000-gallon rubber-lined steel storage tanks to store aqueous ammonia solution.

The delivery frequency is highly variable and depends on production rates and required chemical dose rates. At the average year-round production rate of 18 mgd, the pre-design report used a design criterion of one delivery of each chemical (five to six chemicals) every 14 days. This represents a reduction from the current number of deliveries.

In the event of accidental spills and releases of hazardous materials, the Operation Procedures (Tracer 2004b) and Emergency Response (Tracer 2004a) reports outline specific procedures for personnel at Perdue WTP. In addition to providing emergency response details, these reports include emergency planning guidelines. The Operation Procedures discuss the operation of the equipment, containers/tanks, and feed systems at Perdue WTP and explicit steps for responding to leaks, shutdown procedures, reporting events, and post-event start up procedures. The Emergency Response report specifies emergency notification procedures, evacuation responses, emergency training, and incident reporting. Both the Operation Procedures and Emergency Response reports are kept on file at Perdue WTP and Authority offices.

2.9.3 Significance of Impacts

The *Emergency Planning and Response for Sweetwater Authority* (Tracer 2004a) and *Operating Procedures for Sweetwater Authority* (Tracer 2004b) provide safety information, operating procedures, training, hazard documentation, and emergency planning and response measures to ensure that impacts from hazards and hazardous materials would be less than significant.

2.9.4 Mitigation Measures

Although the proposed project is not anticipated to result in significant hazards and hazardous materials impacts, the Authority has established specific responsibilities and procedures that minimize the potential for hazardous incidents and provide appropriate response to ensure public safety during construction and operation of the facilities.

1. Construction Measures. Safety for project workers and the public during project construction is governed by California Occupational Safety and Health Administration (CalOSHA) and requires that a "safe construction practices" plan be prepared. For the proposed project, such a plan would address items such as installing barricades around trenches, especially during construction of open trenches too large to cover with trench plates; plans and specifications for proper staging areas, clearly identifying vehicular and pedestrian access routes; and installation of proper signage, cones, fences, and barricades around construction sites, especially during non-construction working hours. The project site is completely within the existing Perdue WTP property and is not open to the public; however, ingress and egress of construction equipment and trucks to and from the project site would be restricted to a designated haul route and construction times to ensure the safety of the public. In addition, prior to site development involving soil excavation, grading, or other subsurface disturbance, a contingency plan shall be prepared to address the possibility of encountering localized areas of potential hazardous materials concern. The plan shall address monitoring of excavated soil, community and worker health and safety, and soil handling, stockpiling, characterization, on-site reuse, export, and disposal protocols. Appropriate references to the potential to encounter contaminated soils shall be included in construction specifications.

2. Operation Measures. Sweetwater Authority is subject to standards covering areas such as written process safety information, process hazard analysis and evaluation, operating procedures, training, and emergency planning and response. The Authority currently has the appropriate safety protocols in place with the *Emergency Planning and Response for Sweetwater Authority* (Tracer 2004a) and an operations plan with the *Operating Procedures for Sweetwater Authority* (Tracer 2004b) to ensure the safety of its employees and the public.

3. Emergency Planning and Response. Sweetwater Authority and its employees are obligated to report all significant releases or potential releases of hazardous materials. Specific protocols are established to report, evaluate, and identify the extent and details of the releases and the nature of the release to appropriate and designated individuals on the Authority staff and outside assistance personnel. A contact list (names and numbers) and protocol are provided. Evacuation procedures and locations as well as response actions are included in the Emergency Planning and Response plan. A hazardous material incident report form is also included with a list of emergency equipment and the location of the equipment. Emergency training is available and required for Authority personnel.

4. Operating Procedures. Sweetwater Authority shall prepare an updated Operating Procedures plan to reflect the tasks to be performed for the upgraded water treatment facilities being proposed and shall further update the Operating Procedures plan each time that new treatment facilities are installed. The procedures shall outline the data that should be recorded, the safety precautions taken, and the training provided for each operating procedure. The procedures would include delivery, tank change, startup and shutdown, emergency shutdown and operations, startup following an emergency shutdown, normal operations, and temporary operations.

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CHAPTER 3.0
CUMULATIVE IMPACTS

Section 15130 of the CEQA Guidelines requires a discussion of cumulative impacts "when the project's incremental effect is cumulatively considerable," which is defined in Section 15065(a)(3) to mean "that the incremental effects of an individual project are significant when viewed in connection with" past, present, and probable future projects. Section 15130 further provides that the cumulative analysis utilize a list of "projects producing related or cumulative impacts," or utilize "projections contained in an adopted general plan or related planning document … which described or evaluated regional or areawide conditions contributing to the cumulative impact." Additionally, "[l]ead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used."

This evaluation of cumulative effects is limited to projects located in the vicinity of the Perdue WTP where localized incremental project effects could create cumulatively considerable impacts, and to the project's potential impact on planning efforts that are designed to protect the region's land, air, water, and natural habitat resources. Thus, this analysis utilizes both a list of projects in the immediate vicinity and an evaluation of consistency with regional planning documents.

3.1 CUMULATIVE PROJECTS

As can be seen in Figure 3.1, the project site is bounded by the Authority-owned Sweetwater Reservoir open space to the east and south; and by other public park and open space lands along Sweetwater River to the southwest and designated wildlife refuge lands to the southeast. Adjacent to the north are existing single-family detached and attached residential areas. Farther to the north are a swap meet lot and industrial and commercial uses along Swap Meet Road, Quarry Road, and Jamacha Boulevard. The geographic scope of the area affected by potential cumulative impacts of past, present, and probable future projects is generally limited to the area south of Jamacha Boulevard, east of State Route 125, and within and immediately adjacent to Authority property along the south and southwest sides of Sweetwater Reservoir. The delineation of this geographic area is appropriate based on the relatively small project footprint, the existing plant improvements that have been a feature of the site since the 1960s, the distance

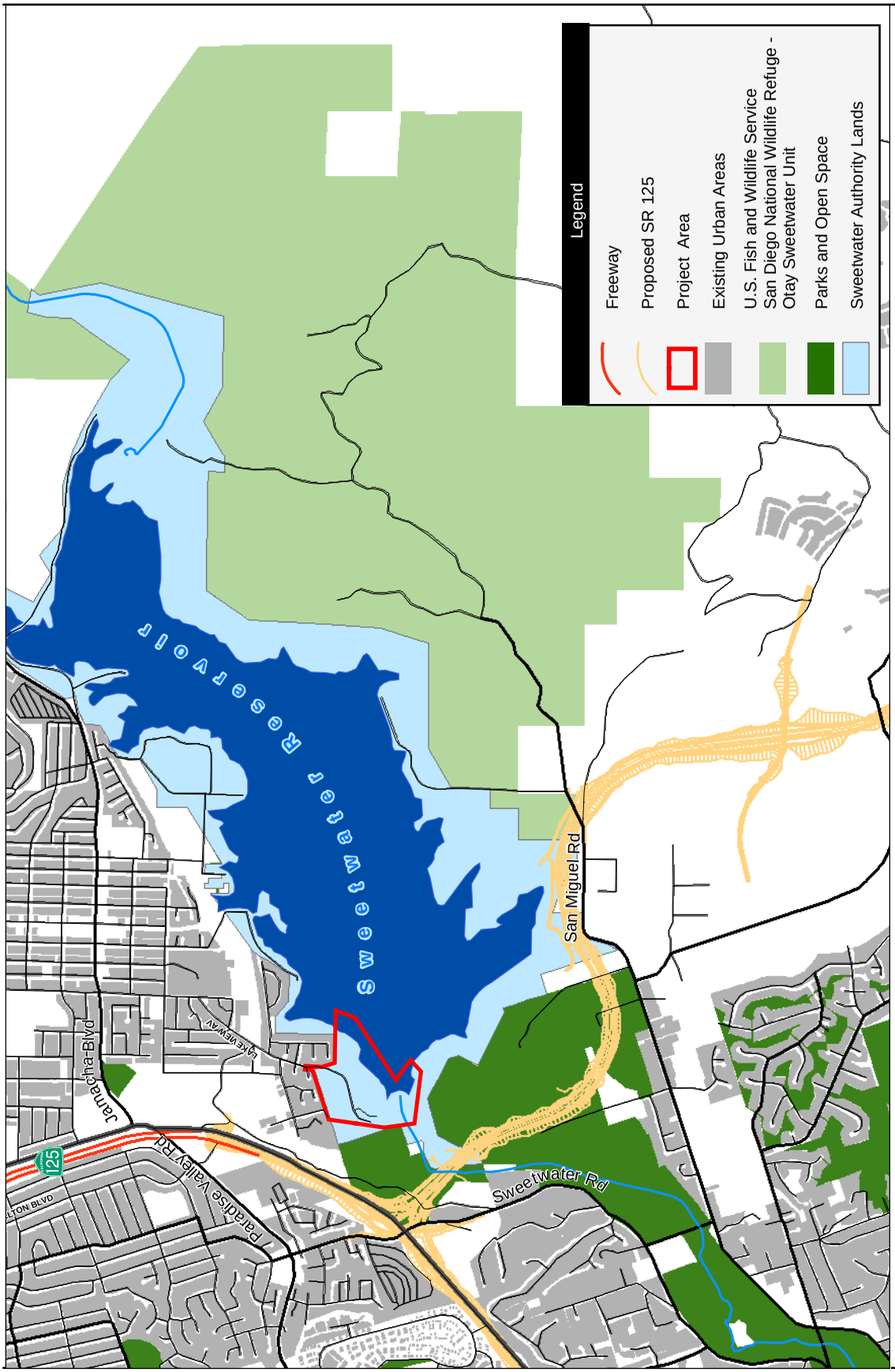

Figure 3.1
Existing Land Use

P:\2004\4K004 R Perdue WTP MP Sweetwater Authority\5GIS\Mxd\SWA\Fig 3.1 Land Use Map.mxd sp83Z6f 11/14/05

from off-site viewers to the south, and topographic barriers to visibility of the project site from most other nearby areas.

Sweetwater Reservoir Recreation Master Plan

The Authority prepared and adopted the Sweetwater Reservoir Recreation Master Plan to provide for public access for recreation use along the southwestern shoreline of Sweetwater Reservoir. In accordance with the Master Plan, improvements were completed in July 2002 to accommodate fishing and pedestrian trail use along 2.5 miles of the Reservoir shoreline. Improvements included an unpaved access road, parking for 150 cars, portable restrooms, tethered trash receptacles, native landscaping, fencing to protect sensitive habitat, and signage and bulletins. An existing revocable riding and hiking easement to the County of San Diego permits pedestrian and equestrian access from the County's Summit Park to the west and to the San Diego National Wildlife Refuge lands to the east. Much of this area is to be preserved as part of the Authority's JWA NCCP, and more intensive recreational uses are not proposed in the southern shoreline area or other Sweetwater Reservoir areas.

A Supplemental EIR prepared for the project (SCH No. 1985101602) identified biological resource impacts by the shoreline fishing project improvements to be approximately 1 acre of mixed native grassland and broken sage scrub and approximately 1 acre of mixed native and nonnative grassland. Biological resource impacts also occurred to Otay tarplant, a vernal pool complex, and an intermittent stream. Other potentially significant impacts were identified for water quality, and public services and utilities. Mitigation measures were provided to reduce all potential project impacts to less than significant levels.

State Route 125

Currently under construction is the extension of State Route 125 from the existing State Route 54 south to Interstate 905. An earlier project that constructed State Route 125 from Highway 94 to State Route 54 has been completed. The current phase of construction began in 2001 and is anticipated to be completed October 2006. The current phase includes a six-lane highway and toll road. A subsequent phase would include the addition of two lanes and a wide median to accommodate two high occupancy vehicle lanes or transit facilities; this phase would begin when the traffic levels on the toll road and surrounding street system warrant the expansion.

The State Route 125 South Final Environmental Impact Report/Statement (SCH No. 89011118) identified significant impacts to noise levels, biological resources, visual resources,

socioeconomics, cultural resources, water quality, recreational resources, and air quality. A statement of overriding considerations was adopted by Caltrans for impacts determined to be unavoidable or not lessened with mitigation. Impacts that remained substantial were social, proximity impacts, community cohesion impacts, community character impacts, open space impacts, park impacts, growth impacts, visual impacts, biological resources impacts, noise impacts, construction impacts, and cumulative impacts.

It was determined that 60.5 acres of coastal sage scrub would be directly impacted by the project, of which 21.7 acres are in and around the Sweetwater Reservoir area. Impacts to coastal sage scrub required mitigation consisting of dedicating 1,100 acres of off-site habitat supporting 32 pairs of California gnatcatcher.

State Route 54 Extension

Right-of-way was acquired in the past for the extension of State Route 54 east of State Route 125. This alignment would be approximately 1,500 feet north of the Perdue WTP site. Caltrans staff members have advised that there is no funding for design nor a schedule for construction of this route at this time, and they are uncertain when further studies for construction of this route might occur.

Other Projects in the Area

Research was conducted at the County Department of Planning and Land Use in November 2005 to identify other past, present, and probable future projects in the geographic area described above. A 14-lot subdivision (TM 5367) was filed in April 2004 on property located on the north side of Leigh Avenue, west of Lakeview Avenue, and approximately 800 feet north of the Perdue WTP property. All other projects of record were minor uses, most of which are not subject to CEQA review, such as setback variances and other minor deviations from County zoning regulations.

3.2 PLANNING DOCUMENTS

San Diego County General Plan

The Authority's Sweetwater Reservoir property lies within two community plan areas, both of which are portions of the San Diego County General Plan. The Perdue WTP project site and the south side of the Reservoir lands are within the Sweetwater Community Plan area; the remainder

of the Reservoir property east of the project site is within the Spring Valley Community Plan area. The Sweetwater Community Plan was first adopted in August 1977 and the Spring Valley Community Plan was adopted in May 1989. No recent comprehensive environmental documents for these community plans have been approved. However, the County is currently conducting a comprehensive update of its entire General Plan, a study known as General Plan 2020, and will include updates to each of the County's community plans and an EIR.

Joint Water Agency NCCP

Expansion of the Perdue WTP is included as a covered project in the Authority's JWA NCCP Subarea Plan. This coverage will provide take authorizations for covered species and their habitats, including any impacted by the project. Habitat compensation will be provided within mitigation banks at Sweetwater Reservoir, where land will be set aside and managed as a wildlife preserve. Implementation of the Authority's JWA NCCP Subarea Plan is intended to avoid significant cumulative impacts to sensitive species.

3.3 IMPACT ANALYSIS

Hydrology and Water Quality

The proposed project would not result in cumulatively significant water quality impacts. The Perdue WTP and the shoreline fishing program avoid significant hydrology and water quality impacts by implementing stormwater management and runoff measures during construction and, thus, would not result in an incremental significant effect to these resources.

Air Quality

The proposed project would not result in cumulatively significant regional and local air quality impacts since it would be in compliance with state and federal ambient air quality standards. In addition, the upgrades at the Perdue WTP are intended to comply with state and federal water quality regulations and serve the projected population within the Authority's service area. Thus, the project would be consistent with the SDAPCD RAQS, which is a long-range air quality planning document that is based on projected population increases within the air basin.

Noise

Noise level impacts from construction and operation of the State Route 125 South project, which were not fully mitigated, represent a cumulatively significant impact. However, the Perdue WTP and the shoreline fishing program would avoid significant noise impacts by complying with County Noise Ordinance construction standards and, thus, would not result in an incremental significant effect to noise levels in the area. In addition, it is expected that construction of the nearby portion of State Route 125 South would be completed prior to commencement of construction at the Perdue WTP; therefore, existing construction noise associated with State Route 125 South would no longer impact the local area.

Land Use and Planning

The proposed project would not change the existing use of the Perdue WTP and construction and operational activities associated with the facility would be confined to the project site and roads serving the Authority property. No additional land, besides that currently owned by the Authority, is being proposed for use. Due to the small scale of the proposed project and the absence of other substantial land use planning projects in the nearby vicinity, the community character that exists today will remain with project completion, and cumulative land use and planning impacts would be less than significant.

Aesthetics and Visual Resources

Significant changes to the visual character of the area have resulted from the construction of State Route 125 South, an impact that was found to be significant and not fully mitigated. The shoreline fishing project is visually consistent with the open space and public recreational character of the Sweetwater River valley. The visual features associated with the Perdue WTP improvements are consistent with the existing visual character of the treatment plant facilities and would require only relatively minor landform modification for the proposed Phase I improvements. Phase II improvements would also be located within and adjacent to existing developed areas of the plant site, though detailed site plans for these facilities have not yet been prepared. Thus, the project's contribution to cumulative impacts to aesthetics and visual resources would be less than significant.

Biological Resources

Impacts of the State Route 125 project to 60.5 acres of coastal sage scrub, of which 21.7 acres are in and around the Sweetwater Reservoir area, and to California gnatcatcher and other sensitive biological resources, represents a cumulatively significant biological resource impact. The shoreline fishing project resulted in 9.82 acres of impact to biological resources, including 0.96 acre of mixed native grassland and broken sage scrub, and provided a conservation easement over 20.21 acres of habitat as mitigation for this impact. The proposed project's impact to 1.3 acres of coastal sage scrub would contribute to a cumulatively significant impact to biological resources in the project area from the State Route 125 and shoreline fishing projects. However, preservation of 2.49 acres of habitat in a conservation easement in accordance with NCCP requirements, would mitigate the Perdue WTP project's cumulative impacts to biological resources to below a level of significance.

Historical and Archaeological Resources

Historical and archaeological resource impacts of the State Route 125 South project, which were not fully mitigated, represent a cumulatively significant impact. However, the Perdue WTP and the shoreline fishing program would avoid direct cultural resource impacts and, thus, would not result in an incremental significant effect to these resources.

Geology and Soils

The State Route 125 South project, the Perdue WTP, and the shoreline fishing program would each comply with accepted common geotechnical design and construction procedures and standards and, thus, would not result in an incremental significant effect to geology and soils resources.

Hazards and Hazardous Materials

Potential public health and safety impacts associated with handling and use of hazardous chemicals are unique to the Perdue WTP project and would be avoided through the Authority's adopted plans for emergency response and safe operating procedures. Thus, the project would not result in an incremental significant effect to hazards and hazardous materials.

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CHAPTER 4.0
PROJECT ALTERNATIVES

4.1 RATIONALE FOR ALTERNATIVE SELECTION

The following project alternatives are analyzed for consistency with the project's statement of purpose and need in Section 1.2.3 of this EIR and for their ability to avoid or substantially lessen the project's significant environmental effects. Due to the public health considerations that are essential to the proposed project, an alternative project must also enable the Authority to fully comply with the current and proposed federal and state drinking water regulations for removal of harmful microorganisms and other potential contaminants from its source water. Additionally, the alternatives need to meet the current and future water use demands of the Authority's customers in a manner that is consistent with the financial resources of the Authority and its customers. Other relevant criteria to be considered in the alternatives analysis are minimizing impacts to coastal sage scrub and other sensitive biological habitat; avoiding economically inefficient water treatment processes, such as those that would require excessive pumping to elevate water through the treatment process train; and opportunities to maximize use of local surface water sources from Authority reservoirs and reduce the need to purchase imported water from SDCWA. Due to existing financial investment in infrastructure at Perdue WTP and its location adjacent to the Sweetwater Reservoir and on the SDCWA aqueduct, the possibility of finding a suitable off-site and economically feasible alternative is speculative and is not evaluated in this EIR.

4.2 NO PROJECT ALTERNATIVE

With the No Project Alternative, the Authority would not construct the Master Plan improvements described in Section 1.3 of this EIR. Thus, potentially significant construction and operational impacts to hydrology and water quality, air quality, noise, aesthetics and visual resources, biological resources, and hazards and hazardous materials would not occur. Due to state and federal drinking water standards described in Section 1.5.2 of this EIR, the No Project Alternative would not enable the Authority to continue to use its local surface water sources and bring the Perdue WTP into compliance with requirements of USEPA. The drinking water standards that necessitate improvements in the water treatment process at the Perdue WTP include requirements to remove the byproducts of disinfection chemicals used in the water

treatment process and comply with maximum contaminant levels set by USEPA for the microbial pathogens *Giardia lamblia*, *Legionalla*, and *Cryptosporidium* in treated water.

As stated in its 2005 UWMP, the Authority "operates with a goal to diversify its supplies to maximize reliability and minimize cost to customers" (Sweetwater Authority 2005a). To achieve this goal, it is essential that the Authority fully use local water sources and avoid dependence on imported water from the SDCWA, which is subject to the competing needs of three million residents in 23 member agencies. Furthermore, up to 90 percent of SDCWA water is provided by the Metropolitan Water District of Southern California, which, in addition to SDCWA, serves the needs of 25 other member agencies in Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. Therefore, the No Project Alternative would not meet the Authority's goal of a diversified water supply and would not serve the interests of its customers as well as would the proposed project.

4.3 ALTERNATIVE WATER TREATMENT PROCESS

In 2000, the Authority began a multi-year, comprehensive program for evaluation of a variety of alternative treatment processes that would enable it to meet pending federal and state regulatory requirements. This process resulted in the November 2003 *Master Plan for Future Plant Facilities* (Montgomery Watson Harza 2003b). Alternative treatment processes evaluated during preparation of the Master Plan included the use of ozone as a primary disinfectant, new UV disinfection and a chlorine contact basin, and a third flocculation/sedimentation basin. Each of these or a combination of elements from the alternatives could feasibly meet regulatory requirements. In conducting a thorough evaluation of the alternatives, a 1-year pilot study of the ozone disinfection was completed. That study showed that ozone would be effective but would have to be operated at limited dosage rates because of bromide levels in the source water and would result in higher chemical use than the existing plant or other alternatives.

UV disinfection does not yet have CDHS acceptance and would require construction of a new chlorine contact basin in order to meet requirements of the IESWTR for removal of *Giardia lamblia*, *Legionalla*, and *Cryptosporidium*. It would, however, have lower electrical power needs than the other alternatives. However, hydraulic constraints were identified with the chlorine contact basin that would result in a loss of storage capacity in the existing clearwell and require a new clearwell with a larger footprint to achieve the same storage volume.

Construction of a third flocculation/sedimentation basin would provide enhanced coagulation for increased removal of harmful microorganisms from raw water sources. This would involve

replacement of the existing basins with new basins located to the north of the existing sedimentation basins. However, this change in the influent elevation for delivery of raw water into the process train created an impact on the capacity of the raw water pump station for water delivery from the Reservoir.

The proposed MFS facility would avoid or minimize the constraints posed by the other alternatives, require no more power than ozone treatment, would lower the plant's chemical consumption, and would maintain the full raw water delivery capacity of the Reservoir pump station. Based on this thorough evaluation of alternative treatment processes, the Authority has determined that these alternatives would not better achieve the project's statement of purpose and need and would require substantial modification of existing facilities and/or new construction and, thus, would not avoid or substantially lessen the significant effects of the project.

4.4 ALTERNATIVE LOCATION WITHIN PERDUE WTP

The Authority has also evaluated the possibility of an alternate location for the proposed MFS facility that would not impact coastal sage scrub. The primary constraint on an alternate location is the need to maintain a hydraulic gradient through the treatment process that allows the water to flow by gravity and avoid the need for pumping, which increases electrical power consumption. The proposed location allows gravity flow from the flocculation/sedimentation basins into the MFS and from there into the clearwells. Pumps are required at the MFS to force the water under pressure through the extremely small pores in membrane filters.

As shown in Figure 1.10, the Perdue WTP site is highly constrained by coastal sage scrub. To the east of the clearwells are existing facilities that can be relocated to minimize new impacts to coastal sage scrub. The proposed MFS location also facilitates the Authority's proposed replacement of the existing clearwells in Phase II of the project. The new clearwells would be within a smaller footprint and would enable other future plant facilities shown in Figure 1.9 to utilize a portion of the existing clearwell area and minimize other future encroachment into coastal sage scrub.

The proposed location for the MFS facility is substantially below and approximately 800 feet from the nearest residences. By locating the facility within an excavated area of an existing slope (see Figures 2.2 and 2.3), noise and visual impacts to adjacent residents could be minimized.

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CHAPTER 5.0
LONG-TERM ENVIRONMENTAL EFFECTS

5.1 GROWTH-INDUCING IMPACTS

Growth inducement can result from any project that makes it economically, politically, or socially more feasible for development to occur. The expansion, extension, or improvement to a public facility, such as a water treatment plant, can generate substantial growth in the area by serving new development. The purpose of the proposed project is to comply with federal and state drinking water regulations and to accommodate projected population growth within its service area by increasing the capacity of Perdue WTP facilities to provide an adequate water supply for the needs of its service area. The Phase I membrane filtration project is designed to provide a level of treatment that will enable the plant to comply with requirements of USEPA for removal of the byproducts of chemicals used in the water treatment process and comply with maximum contaminant levels set by USEPA for the microbial pathogens *Giardia lamblia*, *Legionalla*, and *Cryptosporidium* in treated water. The project does not include an expansion of its service area or new water line extensions that would potentially induce growth outside of the existing urbanized area that it presently serves (see Figure 1.5).

The Perdue WTP is currently rated for a maximum water treatment flow of 30 mgd and the typical annual demand has been 20 to 25 mgd. However, plant operations must be capable of meeting not only the typical daily demand, but also the maximum daily demand, which was 30 mgd in 2004. The *Master Plan for Future Plant Facilities* (Montgomery Watson Harza 2003b) proposes to upgrade treatment capacity to 42 mgd, which would enable the facility to meet maximum daily demand and accommodate planned growth in the Authority's service area. The estimated year 2005 population within the service area is 175,485. As described in Section 1.2.3, Purpose and Need for the Proposed Project, phased improvements to the plant's treatment capacity would enable the 42 mgd treatment capacity to be reached by year 2030, when the population within the Authority's service area is projected to be 236,730 (Sweetwater Authority 2005a). If growth in the service area accelerates beyond recent trends, the Authority would be prepared to accelerate scheduled treatment plant improvements to fully serve its customers' needs.

Planned improvements at the Perdue WTP would be sized with adequate capacity for the projected year 2030 demand as described in Section 1.2 of this EIR. The Purpose and Need is

further described in Section 1.2.3. The Authority provides services within existing urbanized areas of the cities of Chula Vista and National City and unincorporated areas in the communities of Sweetwater, Sunnyside, and Bonita. As an independent special district, the Authority has no land use jurisdiction within its service area. These areas are currently served by a full range of public facilities and services administered by the cities, the County, and special districts. The planned population increase from 175,485 in 2005 to 236,730 in 2030 would result from development in accordance with each city's and the County's general plans and would require an increase in public services provided by each jurisdiction. This increased level of public services would be a secondary impact of planned growth that was anticipated in the preparation of each jurisdiction's land use plans and associated CEQA documents; and does not represent a substantial overall population increase or rate of population growth that would be beyond the capability of each jurisdiction to expand public services concurrent with need.

5.2 SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSED PROJECT IS IMPLEMENTED

The only significant irreversible changes due to the proposed project would affect biological resources. The proposed expansion of developed areas within the Perdue WTP would result in the permanent removal 1.19 acres of coastal sage scrub habitat and temporary impact to an additional 0.11 acre. This impact to biological resources is minimized by locating new facilities adjacent to the existing developed areas and preserving 2.49 acres of habitat in a JWA NCCP mitigation bank. The project design provides an efficient hydraulic gradient through the treatment process to minimize the plant's energy consumption. To avoid additional biological impacts, the existing clearwell will be removed to provide the site for Phase II facilities.

5.3 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES WHICH WOULD BE CAUSED BY THE PROPOSED PROJECT SHOULD IT BE IMPLEMENTED

The principal construction materials to be used for the plant expansion would be concrete for the membrane basins in Phase I and other structures in Phase II. Concrete can be recycled by crushing and reused for purposes such as road base should these basins not be needed in the future, though the obsolescence of the basins is not a likely scenario for the foreseeable future. The membrane process in Phase I and other potential improvements in Phase II, such as the solids handling facility and the UV treatment system, would require increased consumption of electrical power, which is currently largely dependent on nonrenewable fuel sources. This increased use of electrical power by membrane filtration and UV systems is essential for

compliance with increased state and federal drinking water standards. The solids handling facility is proposed in order to avoid disposal of effluent from the treatment process back into Sweetwater Reservoir. This disposal method is inefficient because it requires use of electrical power to continually remove previously disposed effluent and results in increased pathogen concentrations in the Perdue WTP source water. The Phase II project also proposes to install a hydroturbine facility at the SDCWA water intake station to generate a renewable source of electrical power. That would offset a portion of the increased energy consumption required for the modified treatment process.

Chemicals used at the Perdue WTP are standard chemicals used at water treatment facilities throughout San Diego County and the United States. Although their use creates the potential for accidents in the delivery, handling, and use of these chemicals in the treatment process, the Authority maintains emergency planning and response guidelines and operating procedures to minimize the potential for public safety impacts as discussed in Section 2.9 of this EIR. The potential for irreversible environmental changes to result from accidents involving the chemicals is very low and not considered to be significant.

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CHAPTER 6.0
ENVIRONMENTAL EFFECTS FOUND NOT TO BE SIGNIFICANT

The Authority has evaluated each of the environmental factors identified in the CEQA Guidelines and has determined that the proposed project would not result in significant environmental impacts to agricultural resources, mineral resources, paleontological resources, population/housing, public services, recreation, transportation/traffic, and utilities/service systems. These issues are summarized below and are not addressed in the environmental analysis chapter of this EIR.

6.1 AGRICULTURAL RESOURCES

The proposed project is located on property that has been previously developed for the existing water treatment plant and associated operations. No agricultural resources are existing on or around the project site. Expansion of the Perdue WTP would not convert farmland to nonagricultural use, conflict with existing zoning for agricultural use, or affect farmland that is under a Williamson Act contract.

6.2 MINERAL RESOURCES

The proposed project is located on a property site that has been previously developed for the existing water treatment plant and is not suitable for mineral extraction. Expansion of the Perdue WTP would not result in the loss of available known regional or local mineral resources during construction or operation of the facilities.

6.3 PALEONTOLOGICAL RESOURCES

The geologic formations underlying the project site are Santiago Peak Volcanics, weathered volcanics, and fill. Specifically, metavolcanic rock within the Santiago Peak Volcanics was observed during geological site reconnaissance. This geologic formation is rated with a marginal sensitivity level for paleontological resources. Marginal sensitivity is assigned to geologic formations that are composed either of volcanic rocks or high-grade metasedimentary rocks, but which nevertheless have a limited probability for producing fossil remains from certain sedimentary lithologies at localized outcrops. Expansion of the Perdue WTP would not result in the loss of known paleonotogical resources during construction or operation of the facilities.

6.4 POPULATION/HOUSING

One of the objectives of the proposed expansion of the Perdue WTP is to provide treated water to meet the existing and projected demand due to growth within the area. The proposed project would not affect the local or regional population or housing as the proposed project would not induce substantial population growth in the area. Improvements to the existing facilities would not displace existing housing or people or be located on a site designated for residential development as the proposed project is located on the site of the Perdue WTP.

6.5 PUBLIC SERVICES

The project would provide improved water service to accommodate planned growth within its service area. This indirect effect on public services, including library and school services, would not be substantially adverse. No direct impacts or increased demands to public services, such as police and fire protection, would occur with implementation of the proposed project. Emergency service access would be maintained throughout project construction.

6.6 RECREATION

The proposed project would not create a demand for recreational facilities or allow for recreational uses at Sweetwater Reservoir. The proposed improvements are located on the property of the existing Perdue WTP and therefore would not be in conflict with existing and planned recreational facilities in the area. The Authority maintains public fishing and trail use recreational facilities on the southerly side of the Reservoir.

6.7 TRANSPORTATION/TRAFFIC

Project construction traffic would involve contractor employee vehicles and materials delivery, including trucks for removal of excavated materials from the project site and concrete delivery trucks for construction of the MFS basins. Access to the site would be provided from State Route 125 via Paradise Valley Road/Jamacha Road, Swap Meet Road, Quarry Road, and Lakeview Avenue. These local roads are relatively lightly traveled and have adequate capacity to avoid significant adverse effects on roadway levels of service. Construction traffic would be temporary in nature and would not block emergency access to nearby uses. During the project construction phase, project-related trucks and equipment would use streets serving residential areas limited to particular times during the day and would not occur every day. The construction bid documents would require the contractor to prepare a construction access plan that identifies methods for

minimizing project-related traffic hazards within or near residential areas. The construction access plan would address conflicts associated with construction traffic during mobilization and demobilization of the project (i.e., delivery of equipment and materials, removal of equipment, etc.). In addition, advance notification would be provided to residents along construction access routes and traffic control when warranted. Construction staging and parking areas would be located on-site of the Sweetwater Reservoir property. No impacts to adjacent residential neighborhoods, parks and other public facilities, or other existing land uses due to insufficient parking would occur as a result of the proposed project construction. Upon completion of project construction, traffic associated with operation of the facility would not substantially increase over existing conditions. A minimal increase in Authority staff (i.e., less than ten) at the Perdue WTP would be expected, and delivery of materials to the plant would be very similar to the existing delivery schedule.

6.8 UTILITIES/SERVICE SYSTEMS

The purpose of the proposed project is to meet existing and future drinking water regulations. Installation and use of the proposed MFS facility would increase electrical power usage at the Perdue WTP. The 5-year median power usage to pump and treat the water (Authority maximum usage) is 160 kilowatt hours per acre-foot of water (kWh/Af). To treat imported water requires 20 kWh/Af because no pumping is required (Thomson 2006). The membrane filtration will require an additional 36.4 kWh/Af (McClelland 2006b). According to San Diego Gas & Electric, the increased energy consumption will not require additional primary feed for the operation of the MFS facility. These increased demands for electrical power are essential to project operations and would not represent excessive or inefficient use of energy.

Subject to approval by the SDCWA, a hydroturbine facility for electrical power generation from the SDCWA water intake station would be installed during Phase II. This facility would offset a portion of the increased energy consumption.

In 2002, approximately nine acres of the Perdue WTP site were annexed to Spring Valley Sanitation District. An increase in the annexation area will be required to place sewage force mains south of the clearwell. Additionally, the annexation and approval from Spring Valley Sanitation District must be modified to allow neutralized effluent from the MFS.

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CHAPTER 7.0
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CHAPTER 8.0
LIST OF EIR PREPARERS AND PERSONS AND ORGANIZATIONS CONSULTED

Sweetwater Authority

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Don Thomson, Director of Water Quality

Rick Alexander, Director of Environmental & Governmental Services

Troy Murphree, Principal Environmental Coordinator

Peter Famolaro, Biologist

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Julie Wang, Environmental Specialist/Project Manager

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Bill Maddux, Environmental Engineer

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Tanya Wahoff, Associate Archaeologist

Collin Tuthill, Staff Archaeologist

Randy Yakos, GIS Specialist

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Therese Tempereau, Technical Editor

Ninyo & Moore

Gregory T. Ferrand, C.E.G., Principal Geologist

Erik Olsen, G.E., Chief Geotechnical Engineer

APPENDICES

FOR THE
DRAFT ENVIRONMENTAL IMPACT REPORT

ROBERT A. PERDUE WATER TREATMENT PLANT MASTER PLAN FOR FUTURE PLANT FACILITIES

State Clearinghouse Number 2004011048

Prepared for

Sweetwater Authority
505 Garrett Avenue
Chula Vista, CA 91910
(619) 420-1413

LIST OF APPENDICES

A. NOP and Responses
B. Drainage Memorandum
C. Biological Resources Report
D. Cultural Resources Inventory
E. Geotechnical Evaluation

APPENDIX A
NOP and Responses

NOTICE OF PREPARATION

TO: State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

FROM: Sweetwater Authority
P.O. Box 2328
505 Garrett Avenue
Chula Vista, CA 91912-2328

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

Sweetwater Authority will be the Lead Agency, and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information, which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the probable environmental effects are contained in the attached materials. A copy of the Initial Study is not attached.

The proposed project is not considered a project of regional significance. The proposed project will not affect highways or other facilities under the jurisdiction of the State of California Department of Transportation. A scoping meeting will not be held by the lead agency.

Your response must be sent at the earliest possible date, but no later than thirty (30) days after receipt of this notice.

Please send your response to James L. Smyth, Chief Engineer, at the address shown above. We will need the name for a contact person in your agency.

PROJECT TITLE: Robert A. Perdue Water Treatment Plant Master Plan
PROJECT LOCATION: 100 Lakeview Avenue, Spring Valley, CA 91977
PROJECT DESCRIPTION: See attached

Date: 1/5/04

Signature: James J. Smyth
Title: Chief Engineer
Telephone: (619) 409-6750

PROJECT DESCRIPTION

Sweetwater Authority (Authority) is a public agency and water purveyor in the South Bay area of San Diego County serving the City of National City, the western portion of the City of Chula Vista, and the unincorporated community of Bonita. The Authority operates Sweetwater Reservoir to store local and imported water for its approximately 176,210 customers. Sweetwater Reservoir is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (**Attachment A**).

The project objective is to provide a long-term development plan for all modifications that will be required to address foreseeable capacity requirements and water quality regulations. The area of impact will be the immediate vicinity of the existing water treatment plant and facilities. The majority of the project will be new structures and piping with a limited amount of rehabilitation of existing facilities **(Attachment B).** Although the project site is generally developed, the project is anticipated to encroach into adjacent areas containing sensitive biological resources. Additionally, a substantial amount of earthwork will be required, with some long-term onsite stockpiling of excess excavation material.

The process improvements and additions will include the following:

- Replacement of pretreatment facilities
- Rehabilitation of the existing filter modules
- Replacement of disinfection and/or inactivation facilities
- Replacement of potable water storage facilities
- Replacement of facilities for the management of residuals
- Reconfiguration of the existing chemical storage facilities

Probable Environmental Effects

Preliminarily, the analysis of the following issues is anticipated:

- Aesthetics
- Biological Resources
- Hazards and Hazardous Materials
- Hydrology / Water Quality
- Noise
- Air Quality
- Geology / Soils
- Transportation / Traffic

ATTACHMENT "A"
SWEETWATER RESERVOIR & DAM
250 0 250 500 750 Feet
N
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FLOCCULATION AND SEDIMENTATION BASIN

SDCWA EASEMENT

CHLORINE DIOXIDE FACILITY

SODIUM HYPOCHLORITE FACILITY

SDCWA RAW WATER TURNOUT STRUCTURE

FeCl TANK

EXIST. FILTERS

STORAGE

HAZARDOUS MATERIALS STORAGE

BASIN 1

BASIN 2

BAY 1

BAY 2

FUTURE ADVANCED TREATMENT FACILITIES

FUTURE ADDITIONAL FILTER

UV DISINFECTION SYSTEM

SOLIDS HANDLING FACILITIES

CHLORINE CONTACT BASIN

OTAY WD PUMP STATION

ABANDON EXISTING 10 MG CLEARWELL

N

SCALE: 1" = 100'

50 MGD ALTERNATIVE

FUTURE PHASES SITE PLAN

Attachment B

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STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Arnold Schwarzenegger
Governor

Jan Boel
Acting Deputy Director

Notice of Preparation

January 13, 2004

To: Reviewing Agencies

Re: Robert A. Perdue Water Treatment Plant Master Plan
SCH# 2004011048

Attached for your review and comment is the Notice of Preparation (NOP) for the Robert A. Perdue Water Treatment Plant Master Plan draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

James Smyth
Sweetwater Authority
505 Garrett Avenue
PO Box 2328
Chula Vista, CA 91912-2328

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Associate Planner, State Clearinghouse

Attachments
cc: Lead Agency

RECEIVED
JAN 16 2004
Sweetwater Authority
Engineering

Document Details Report
State Clearinghouse Data Base

SCH# 2004011048
Project Title Robert A. Perdue Water Treatment Plant Master Plan
Lead Agency Sweetwater Authority

Type NOP Notice of Preparation

Description Provide a long-term development plant for all modifications that will be required to address foreseeable capacity requirements and water quality regulations. The area of impact will be the immediate vicinity of the existing water treatment plant and facilities. The majority of the project will be new structures and piping with a limited amount of rehabilitation of existing facilities.

Lead Agency Contact

Name James Smyth
Agency Sweetwater Authority
Phone 619.409.6750 **Fax**
email
Address 505 Garrett Avenue
PO Box 2328
City Chula Vista **State** CA **Zip** 91912-2328

Project Location

County San Diego
City
Region
Cross Streets
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways
Airports
Railways
Waterways
Schools
Land Use

Project Issues Aesthetic/Visual; Biological Resources; Toxic/Hazardous; Water Quality; Noise; Air Quality; Geologic/Seismic; Soil Erosion/Compaction/Grading; Traffic/Circulation

Reviewing Agencies Resources Agency; Department of Parks and Recreation; Department of Water Resources; Native American Heritage Commission; Department of Health Services; Department of Fish and Game, Region 5; State Lands Commission; State Water Resources Control Board, Division of Loans and Grants; State Water Resources Control Board, Division of Water Quality; State Water Resources Control Board, Division of Water Rights; Regional Water Quality Control Board, Region 9

Date Received 01/13/2004 **Start of Review** 01/13/2004 **End of Review** 02/11/2004

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

County: San Diego **SCH#** 2004011048

Resources Agency

- [■] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  Suzi Betzler
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
  Roseanne Taylor
- [ ] **California Energy Commission**
  Environmental Office
- [ ] **Dept. of Forestry & Fire Protection**
  Allen Robertson
- [ ] **Office of Historic Preservation**
  Hans Kreutzberg
- [■] **Dept of Parks & Recreation**
  B. Noah Tilghman
  Environmental Stewardship Section
- [ ] **Reclamation Board**
  Lori Burford
- [ ] **Santa Monica Mountains Conservancy**
  Paul Edelman
- [ ] **S. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [■] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou

Fish and Game

- [ ] **Dept. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Dept. of Fish & Game 1**
  Donald Koch
  Region 1
- [ ] **Dept. of Fish & Game 2**
  Banky Curtis
  Region 2
- [ ] **Dept. of Fish & Game 3**
  Robert Floerke
  Region 3
- [ ] **Dept. of Fish & Game 4**
  William Laudermilk
  Region 4
- [▨] **Dept. of Fish & Game 5**
  Don Chadwick
  Region 5, Habitat Conservation Program
- [ ] **Dept. of Fish & Game 6**
  Gabrina Gatchel
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  Tammy Allen
  Region 6, Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

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  Dept. of Food and Agriculture
- [ ] **Dept. of General Services**
  Robert Sleppy
  Environmental Services Section
- [■] **Dept. of Health Services**
  Wayne Hubbard
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Debby Eddy
- [ ] **Office of Emergency Services**
  John Rowden, Manager
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse

- [■] **Native American Heritage Comm.**
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- [ ] **Public Utilities Commission**
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- [■] **State Lands Commission**
  Jean Sarino
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Sandy Hesnard
- [ ] **Caltrans - Planning**
  Ron Helgeson
- [ ] **California Highway Patrol**
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  Cathy Creswell
  Housing Policy Division

Dept. of Transportation

- [ ] **Dept. of Transportation 1**
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  District 1
- [ ] **Dept. of Transportation 2**
  Don Anderson
  District 2
- [ ] **Dept. of Transportation 3**
  Jeff Pulverman
  District 3
- [ ] **Dept. of Transportation 4**
  Tim Sable
  District 4
- [ ] **Dept. of Transportation 5**
  David Murray
  District 5
- [ ] **Dept. of Transportation 6**
  Marc Birnbaum
  District 6
- [ ] **Dept. of Transportation 7**
  Stephen J. Buswell
  District 7
- [ ] **Dept. of Transportation 8**
  Linda Grimes,
  District 8
- [ ] **Dept. of Transportation 9**
  Gayle Rosander
  District 9
- [ ] **Dept. of Transportation 10**
  Tom Dumas
  District 10
- [▨] **Dept. of Transportation 11**
  Bill Figge
  District 11
- [ ] **Dept. of Transportation 12**
  Bob Joseph
  District 12

Cal EPA

Air Resources Board

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  Jim Lerner
- [ ] Transportation Projects
  Kurt Karperos
- [ ] Industrial Projects
  Mike Tollstrup

- [ ] **California Integrated Waste Management Board**
  Sue O'Leary
- [■] **State Water Resources Control Board**
  Jim Hockenberry
  Division of Financial Assistance
- [■] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [■] **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
  CEQA Tracking Center

Regional Water Quality Control Board (RWQCB)

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- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Jonathan Bishop
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [■] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____

Last Updated on 01/12/04

STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 – Fax

January 21, 2004

Mr. James Smyth
Sweetwater Authority
505 Garrett Ave.
P.O. Box 2328
Chula Vista, CA 91912-2328

RE: Notice of Preparation: Robert A. Perdue Water Treatment Plant Master Plan
SCH# 2004011048

Dear Mr. Smyth:

Thank you for the opportunity to comment on the above referenced Negative Declaration. The Commission was able to perform a record search of its Sacred Lands File for the project area. The record search failed to indicate the presence of Native American cultural resources in the immediate project area; however, the absence of specific site information in the Sacred Lands File does not guarantee the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

To adequately assess the project-related impact on archaeological resources, the Commission recommends the following action be required:

- ☐ Contact the appropriate Information Center for a records search. The record search will determine:
- Whether a part or all of the project area has been previously surveyed for cultural resources.
- Whether any known cultural resources have already been recorded on or adjacent to the project area.
- Whether the probability is low, moderate, or high that cultural resources are located within the project area.
- Whether a survey is required to determine whether previously unrecorded cultural resources are present.
- ☐ The final stage of the archaeological inventory survey is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
- Required the report containing site significance and mitigation be submitted immediately to the planning department.
- Required site forms and final written report be submitted within 3 months after work has been completed to the Information Center.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend other with specific knowledge. A minimum of two weeks must be allowed for responses after notification. If you receive notification of change of addresses and phone numbers from any these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information.

Lack of surface evidence of archeological resources does not preclude the existence of archeological resources. Lead agencies should include provisions for accidentally discovered archeological resources during construction per California Environmental Quality Act (CEQA), Public Resources Code §15064.5 (f); Health and Safety Code §7050.5; and Public Resources Code §5097.98 mandate the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery and should be included in all environmental documents. If you have any questions, please contact me at (916) 653-6251.

Sincerely,

Carol Gaubatz
Program Analyst

cc: State Clearinghouse

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NATIVE AMERICAN CON CTS
San Diego County
January 20, 2004

Barona Group of the Capitan Grande
Clifford LaChappa, Spokesman
1095 Barona Road — Diegueno
Lakeside , CA 92040
(619) 443-6612/13

Viejas Band of Mission Indians
Anthony Pico, Chairperson
PO Box 908 — Diegueno/Kumey
Alpine , CA 91903
(619) 445-3810
(619) 445-5337 Fax

Ewiiaapaayp Tribal Office
Harlan Pinto, Chairperson
PO Box 2250 — Kumeyaay
Alpine , CA 91903-2250
(619) 445-6315

Kumeyaay Cultural Historic Committee
Ron Christman
56 Viejas Grade Road — Diegueno/Kumey
Alpine , CA 92001
(619) 445-0385

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
PO Box 365 — Diegueno
Valley Center , CA 92082
(760) 749-3200
(760) 749-3876 Fax

Jamul Indian Village
Leon Acevedo, Chairperson
P.O. Box 612 — Diegueno/Kumey
Jamul , CA 91935
(619) 669-4785
Fax: (619) 669-4817

Sycuan Band of Mission Indians
Danny Tucker, Chairperson
5459 Dehesa Road — Diegueno/Kumeyaay
El Cajon , CA 92021
619 445-2613
619 445-1927 Fax

Carmen Lucas
PO Box 44 — Diegueno - Kwaa
Julian , CA 92036
(619) 709-4207

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regards to cultural resources assessment for the proposed Robert A. Perdue Water Treatment Plant Master Plan, SCH # 2004011048.

NATIVE AMERICAN CON CTS
San Diego County
January 20, 2004

Kumeyaay Cultural Repatriation Committee
Steve Banegas, Spokesperson
1095 Barona Road Diegueno/Kumeyaay
Lakeside , CA 92040
(619) 443-6612
(619) 443-0681 FAX

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regards to cultural resources assessment for the proposed Robert A. Perdue Water Treatment Plant Master Plan, SCH # 2004011048.

8915 Corte Quezada
Spring Valley, CA 91977

January 18, 2004

Sweetwater Authority
P.O. Box 2328
Chula Vista, CA 91912-2328

Re: Notice of Preparation of a Draft Environmental Impact Report
ICO Robert A. Perdue Water Treatment Plant Master Plan

To James L. Smyth, Chief Engineer:

On January 18, 2004, I received the subject notice dated January 9, 2004 which indicated a response required within 30 days of receipt.

My past experiences dealing with the Sweetwater Authority has been unfavorable. Violations of the fire code in not keeping vegetation at a minimum distance from property lines without persistence calls have been annoying. Attachment B of the notice fails to provide me a clear understanding of proposed new structures. The aerial photo taken in Attachment A does not seem to reflect the "solids handling facilities" which is less that 250 feet from my property line. The project description lacks details. Additionally, the noise, air quality, and results of disturbing the natural habitat in such close proximity to residences is of concern.

Request your immediate action to address concerns expressed in this letter. Thank you in advance for your assistance.

Sincerely,

Robert A. Pope Jr.
(Property Owner)

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Sweetwater Authority
Engineering

February 9, 2004

Mr. James L. Smyth
Sweetwater Authority
P. O. Box 2328
505 Garrett Avenue
Chula Vista, Ca 91912-2328

FU 03-10R
(Bird)

Dear Mr. Smyth:

This letter is written on behalf of the residents within the proximity of the work to be accomplished as proposed in the Notice of Preparation of a Draft Environmental Impact Report Project dated 01-09-04.

After a careful review of it's contents, the residents / home owners residing on Corte Quezada and other streets in close proximity to the work project have concerns regarding it's ultimate impact in our neighborhood.

As a result, I personally visited the Robert A. Perdue Water Treatment Plant on February 9, 2004 to obtain additional information. While the information provided by Ms. Troy Murphree, and Mr. Scott W. McClelland was enlightening, and presented in a most cooperative and professional manner; I'm afraid that it leaves many questions and concerns of the residents most affected by the proposal unanswered.

Following is a list of questions, concerns, names, addresses, and signatures of the residents that I've complied for presenting to your organization.

Question 1. What impact will the construction have on our neighborhood as it relates to:
(a) Noise? (b) Dust? (c) Traffic? (d) View of the Lake? (e) Obstructions (f) Smell

Question 2. What do you mean by project not considered a project of regional significance?

Question 3. What do you mean by a scoping meeting will not be held by the lead agency?

Question 4. Who is the lead agency?

Question 5. Will the residents be notified of the results of the inquiries, and be allowed to respond again before the project begins?

Expansion Plans for this facility? Yes/No

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Question 6. I the answer to question 5 is no, what can we do to insure that we are afforded the opportunity to respond?

Question 7. Can you provide the residents with a copy of the proposal that is more user friendly? Recognizing that everyone can not read drawings or blueprints.

Question 8. Where will the on site stockpiling of excavation material be stored? And for how long?

Question 9. What impact will the project have on the wildlife in the area?

Question 10. How long will it take to complete the project?

RESIDENT INFORMATION

NAME	ADDRESS	SIGNATURE
(1) LAVERNE JOSEY	8985 CORTE QUEZADA	Laverne Josey
(2) DON & ANN PAGLIAI	109 VIA TAPIA	Don Pagliai
(3) Ben & Orleta Mignidula	117 " "	Mignidula
(4) Bobby Cruz	125 VIA TAPIA	B. CRUZ
(6) M.M. STEVE BETTS	133 VIA TAPIA	S. Betts
(7) Fernando & Norma Vasquez	151 Via Tapia	
(8) Anna Wood	249 Via Tapia	
(9) NELSON C. TABINGA	241 VIA TAPIA	N.C. Tabinga
(10) ANDREW - ENZA JONES	8960 Corte Pellejo	
(11) Ken Dewar	209 Via Tapia	
GEORGE KUZUKIA	9012 CAMINO LAGO VISTA (2)	
JOE MELBY SV 91977	265 VIA TAPIA	

	NAME	Address	Signature
	Tim & LaLane Haenisch	8957 Corte Quezada Spring Valley	Timothy J Haenisch
(12)	Susan & Josh Beers	8958 Corte Quezada SV	Susan Beers
(13)	Larry & Pam Hewitt	8972 Corte Quezada S.V.	Pam Hewitt
(14)	Rosendo Martinez	8971 Corte Quezada S.V.	
(15)	BERT & ELIZABETH LUPPAG	8943 CORTE QUEZADA S.V. CA.	
(16)	Craig & Elaine Beiser	8929 Corte Quezada S.V. CA.	
(17)			
(18)			
(19)			
(20)			

Sincerely,

Laverne Josey

VISTA DEL TAPIA HOMEOWNERS ASSOCIATION

SPRING VALLEY CALIFORNIA 91977

Alice Bush
101 VIA TAPIA
SPRING VALLEY, CA. 91977
Alice Bush

VINNIE & MARIVI ANTONIO
165 VIA TAPIA
SPRING VA. 91977
Vmili

GREG & CELIA
173 VIA TAPIA
SP. VALLEY - 91977

Evelyn Wilson
201 VIA TAPIA.
SPRING VALLEY CA

Tracy Schaden
257 Via Tapia
Spring Valley, CA 91977

Giordano Bruno Pagliai
Overseer Member

Andy and Enza Jones

Larry and Pam Hewitt

Vern Josey

John and Ann Wood

Ben and Orly Niguidula

Bob and Nellie Cruz

Alice and Steve Bush

"Towards a better neighborhood."
Environment, Beauty and the Spirit of the Law

SWEETWATER AUTHORITY

505 GARRETT AVENUE
POST OFFICE BOX 2328
CHULA VISTA, CALIFORNIA 91912-2328
(619) 420-1413
FAX (619) 425-7469
http://www.sweetwater.org

GOVERNING BOARD
JAMES "JIM" DOUD, CHAIR
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RICHARD A. REYNOLDS
JAMES C. ALKIRE
WANDA AVERY
TREASURER
MARISA FARPÓN-FRIEDMAN
SECRETARY

March 23, 2004

Mr. Laverne Josey
Vista del Lago Citizens Association
8985 Corte Quezada
Spring Valley, CA 91977

Subject: NOTICE OF PREPARATION OF A DRAFT EIR – ROBERT A. PERDUE WATER TREATMENT PLANT MASTER PLAN
SWA FILES: B.P. 03-10E

Dear Mr. Josey:

Thank you for your letter in behalf of the Vista del Lago Citizens Association. We received your letter addressed to James Smyth and dated February 9, 2004. I believe the following information will address your questions about the proposed project.

Question 1: The Environmental Impact Report (EIR) will be prepared in compliance with the California Environmental Quality Act (CEQA). The purpose of the EIR is to analyze all of the issues listed in the Notice of Preparation as well as any new issues raised during the public review period. Sweetwater Authority has recently selected a consulting team to prepare the technical studies on the issues listed below.

- Aesthetics
- Biological Resources
- Hazards & Hazardous Materials
- Hydrology / Water Quality
- Noise
- Air Quality
- Geology / Soils
- Transportation / Traffic

All of the issues listed in your letter will be analyzed in the EIR including dust and smell under *Air Quality*; and view of the lake and obstructions under *Aesthetics*.

Question 2: Staff determined that the project would not be of statewide, regional, or area-wide significance, since it does not have the potential for causing significant effects on the environment extending beyond the city or county in which the project would be located.

Question 3: "Scoping meeting will not be held" means that Sweetwater Authority will not hold a public meeting to further determine the scope of the EIR, that is, what issues should be addressed in the document. The responses to the NOP will be used to determine the scope of the EIR.

Question 4: Sweetwater Authority is the public agency that will act as lead agency. Under CEQA Guidelines Section 15051(a), "If the project will be carried out by a public agency, that agency shall be the Lead Agency even if the project would be located within the jurisdiction of another public agency. "

Question 5: The Vista del Lago Citizens Association will be notified when the EIR is complete. At that time, "A Notice of Availability of a Draft EIR" will be published in the San Diego Union Tribune and provided to all entities that commented on the NOP. That notification will start a second public review period, during which the public will have 45-days to review and comment on the document. Staff and consultants will respond to all comments received during the 45-day review period. The comments and responses as well as any resulting changes to the EIR will comprise the final EIR (FEIR). The public will have at least 10 days to review the FEIR prior to the public meeting during which the Sweetwater Authority Board of Directors will consider the Draft EIR, the public comments received, and responses to the comments to determine whether the EIR is adequate. If the document is found to be adequate, the Board can adopt the EIR and approve the project at that meeting.

Question 6: As described above, the residents will be notified when the EIR is available for review.

Question 7: The EIR will include a number of figures that will be more user-friendly. We apologize for the confusion.

Question 8: The specific location and amount of the excavated material to be stock piled has not yet been determined. This issue will be further explored during the environmental analysis.

Question 9: Impacts to area wildlife will be addressed in the biological resources section. Biological surveys are currently underway.

Question 10: We anticipate that it will be one to two years until the environmental analysis and project planning is complete. The project is anticipated to be constructed in phases over a 10-year period, as funding becomes available.

Currently, the master plan is being developed and refined, but is not defined well enough to indicate with certainty the proposed location, type or size of the facilities. However, we will provide you with a progress update on the planning and environmental analysis before the end of this summer.

If you have further concerns that have not been covered in this letter, please contact Mr. Scott McClelland at (619) 409-6753 or Troy Murphree at 409-6815.

Sincerely,

SWEETWATER AUTHORITY

Mary Ann Mann
Director of Water Quality

MAM: TM

Pc: Mr. Scott McClelland, Sweetwater Authority
Ms. Troy Murphree, Sweetwater Authority
Mr. Jim Smyth, Chief Engineer Sweetwater Authority

25 January 2004

Robert A. Purdue Treatment Plant Master Plan
100 Lakeview Ave.
Spring Valley, Ca. 91977

Attn: Chief Engineer James G. Smyth

Gentlemen:

I have reviewed the plans forwarded to me concerning the property located at 9167 Circulo Margen, Spring Valley, Ca.

In reviewing the black lines on the map it is difficult to place the location of my home since there are no street names indicated.

Please advise me whether or not my property will note any changes in this proposed project.

Thank you for your prompt attention to this request.

Sincerely,

Nita K. Evans

Nita K. Evans, 9167 Circulo Margen, Spring Valley, Ca. 91977
Phone 619 267 7789 FAX 619 434 1267 Email nita17@baja.sdcoxmail.com

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JAN 28 2004
Sweetwater Authority
Engineering

APPENDIX B
Drainage Memorandum

S W E E T W A T E R A U T H O R I T Y
TECHNICAL MEMORANDUM
R.A. PERDUE WATER TREATMENT PLANT DRAINAGE STUDY

Date: **December 21, 2005** **Task:**
Revised February 15, 2006

Status: Revision # 1

Subject: Perdue WTP Drainage Study (BP03-10E)

Prepared by: Jack Adam

Reviewed by: Jim Smyth

Purpose

Improvements at the R. A. Perdue Water Treatment Plant (Perdue Plant) include construction of submerged membranes to replace the existing media filters. The membrane facility (MF) is proposed to be constructed adjacent to the east end of the existing clearwell and accessed via a proposed paved access road. This Technical Memorandum analyzes and addresses drainage improvements required to accommodate the access road and membrane facility. The existing site and drainage basins are shown on **Exhibit 1**.

Existing Site Conditions

The proposed project is located within the Sweetwater Hydrologic Unit (909.11 – 909.35), which encompasses approximately 230 square miles with over 86 percent of the watershed within unincorporated areas of San Diego County. Sweetwater River is impounded by Sweetwater Dam south to create Sweetwater Reservoir, south of Spring Valley. Spring Valley Creek drains into Sweetwater River below the dam, and Sweetwater River continues approximately six miles where it empties into San Diego Bay. Of the 26.35-acre study area, 8.35 acres have been developed with the RAP water treatment plant and associated facilities; this includes paved and unpaved roadways and landscaped areas. The topography of the project site varies from 230 to 315 feet AMSL with moderately steep slopes toward Sweetwater Reservoir. The site is underlain by weathered volcanics, metavolcanic rock and fill (Ninyo & Moore, November 2005).

An Urban Runoff Diversion System (URDS) is located along the north side of the reservoir, and collects surface runoff from upstream and adjacent urbanized areas, transporting it via flumes, pipelines, ponds, and pump stations to an outlet below Sweetwater Dam. The system is designed to minimize the flow of urban pollutants into the Sweetwater Reservoir by capturing runoff from the "first flush" of storms and poor quality "low flow" runoff during the dry season. The system is also designed to capture hazardous spills that can be pumped and removed from the facility. Where the URDS pipeline traverses the project site, it is within an existing road and 20-inches in diameter.

For the purpose of this study, the project area includes an 8.35-acre developed basin, and three generally undeveloped sub-basins. The perimeter of the above sub-basins includes a landscaped park area, CWA easement and pipeline, and storage areas, and drains overland into the lower Sweetwater River or Spring Valley Creek.

Drainage Analysis

The drainage analysis was conducted using the National Resource Conservation Service (NRCS) Win TR-55 software available free online at the NRCS website, and the 2003 San Diego County Hydrology Manual (2003 Manual). Two analyses were conducted: The first analyzed drainage improvements (culverts) needed to pass runoff from various size storms from Sub- basins 1 and 2 under the new access road, and into sub-basin 3. The second determined what size pumping facilities would be required to pump the first flush of storm runoff from the proposed paved areas associated with the access road and membrane facility (AccessRD). Computer generated printouts for each analysis are attached as exhibits to this memorandum.

Storm Data

Rainfall distribution and 24-hour storm rainfall depth and return frequencies shown in Table 1 were used in the analysis. These values were obtained from the 2003 Manual.

Table 1– Storm Data

Storm Event Frequency (years)	Rainfall Depth (inches)
1	1.5
2	2.0
5	2.5
10	3.5
25	4.5
50	5.0
100	5.5

Sub-basin Information

The majority of the developed area onsite is located within the 8.35-acre Perdue Plant drainage basin, and contains the treatment plant complex and most of the existing facilities. Runoff in the basin drains through vegetated channels and concrete swales in the roadways, as well as some underground storm drains, with collected runoff discharged below Sweetwater Reservoir Dam. Sub-basin 1, 2, and 3 are undeveloped with sheet flows draining southerly through vegetated areas toward the reservoir. These four main drainage areas are shown on Exhibit 2. However, only the generally undeveloped sub-basins 1 and 2 and the proposed

paved access road are relevant to this drainage study. The characteristics of sub-basins 1 and 2 and proposed road are shown in Table 2.

Table 2 – Sub-Basin Characteristics

Sub-basin	Area (acres)	Land Use/Condition	Soil Type	Runoff Curve Number
Sub-basin 1	6.57	Sagebrush	D	70
Sub-basin 2	3.91	Sagebrush/fair	D	70
Access Rd	0.83	Paved Driveway	N/A	98

Proposed Project Drainage

Runoff from sub-basins 1 and 2 will drain into sub-basin 3 via culverts under the proposed access road, with riprap place at the discharge points across the road. Since there would be no additional development in sub-basins 1 and 2, there would be no increase in runoff or velocity.

The MF facilities and access road will increase the impermeable surfaces onsite by 0.83 acres. Due to the onsite substrate, permeable paving is not appropriate for the proposed project and the access will be paved with asphalt. As described above, Sweetwater Authority captures and treats the urban runoff from adjacent urbanized areas and redirects it, as appropriate. Similarly, first flush drainage associated with the access road and MF facilities will be collected into a surface drainage catch basin adjacent to the access road, and will flow southeasterly through a drain line, and into the proposed sump drain structure, from which it will be pumped into the URDS pipeline approximately 40 feet downhill.

Results and Recommendations

The first analysis was conducted to confirm the culvert sizing required to convey peak flows from sub-basins 1 and 2 under the proposed access road (Table 3).

Table 3 – Storm Flow Summary Results

	Frequency (year)					
	2	**5**	**10**	**25**	**50**	**100**
Sub-basin 1						
Peak Flow (cfs)	0.35	1.27	4.01	7.55	9.49	11.53
Sub-basin 2						
Peak Flow (cfs)	0.21	0.76	2.38	4.49	5.65	6.86
Total Flow						
Peak Flow (cfs)	0.56	2.03	6.39	12.04	15.13	18.39

For the modeling purposes, runoff from sub-basin 1 and sub-basin 2 was routed through a catch basin and culvert under the proposed access road. Flow was

assumed to be intercepted in a 3-foot wide concrete lined v-ditch along the entire uphill length of the access road, and conveyed to catch basins and culverts along the road. For modeling purposes and to verify culvert sizing, the entire flow was routed through one culvert, with rating curves for both 18- and 24-inch culverts. The results show that one 18-inch culvert; at ¾ capacity will pass approximately 12.3 cfs, which equates to the 25-year storm.

Based on this modeling, it is recommended that three 18-inch culverts be equally spaced along the access road as shown schematically on Exhibit 2. These three culverts will be more than sufficient to pass the 100-year storm without overtopping the road.

The second analysis was to determine the storm flows that would be generated by the paved driveway. The results are shown in Table 4.

Table 4 – Access Road Storm Flow Summary Results

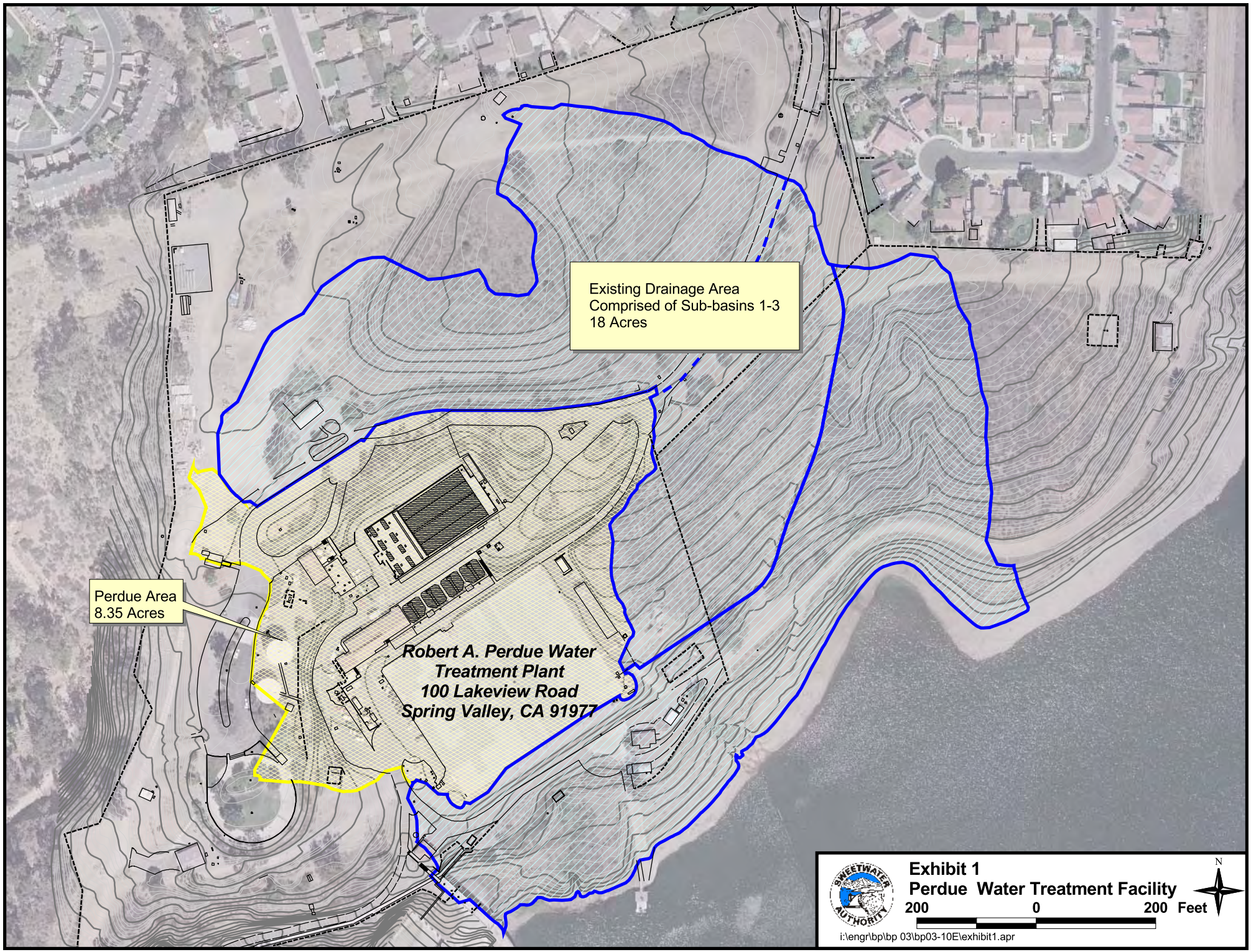
	Frequency (year)					
	2	**5**	**10**	**25**	**50**	**100**
AccessRD						
Peak Flow (cfs)	1.13	1.43	2.02	2.62	2.91	3.21

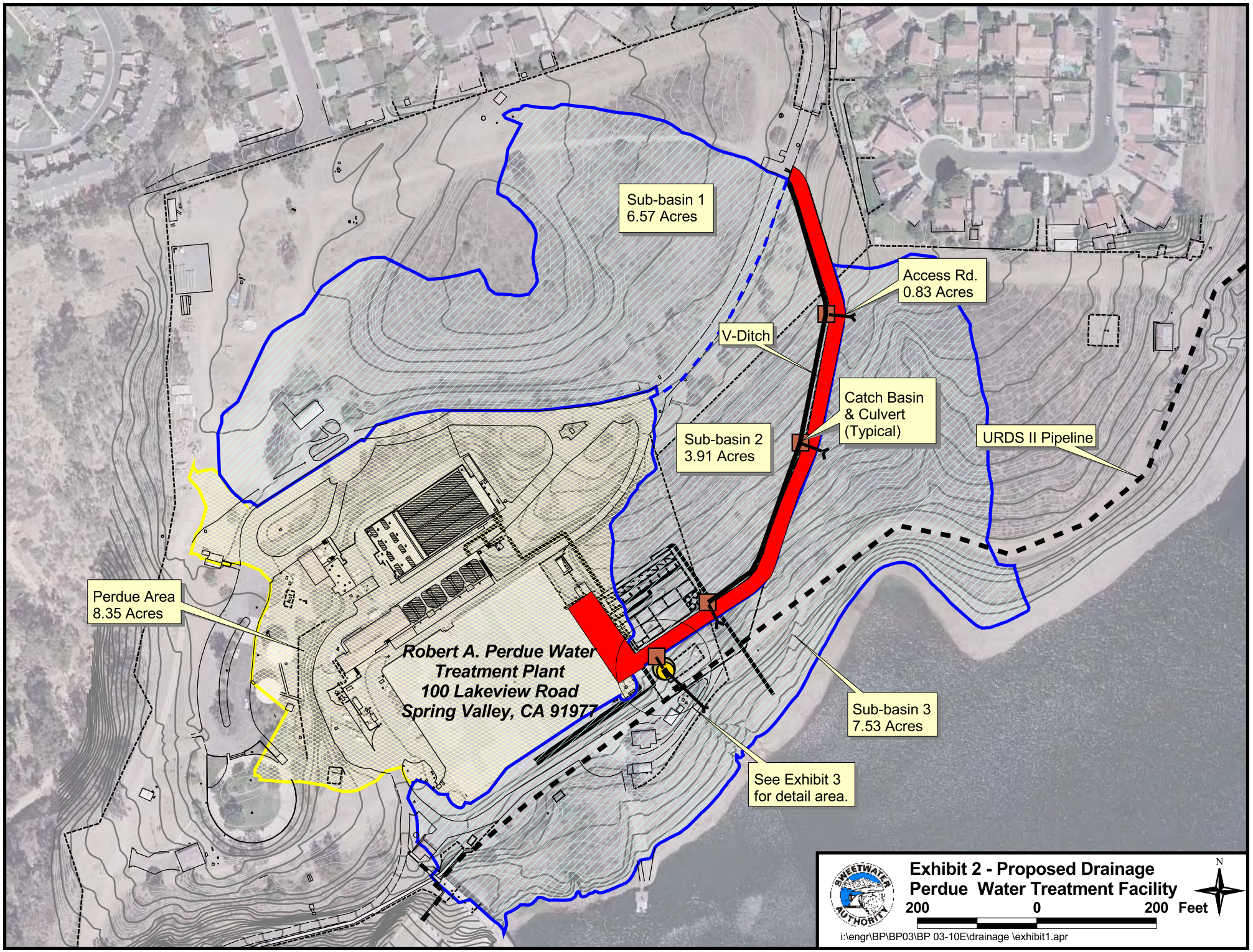
The storm drainage for the first flush estimated as two-year storm event, will be collected into a sump and pumped into the URDS system. This requires a collection system of catch basins and storm drains in the access road as shown schematically on **Exhibit 2**, and described below.

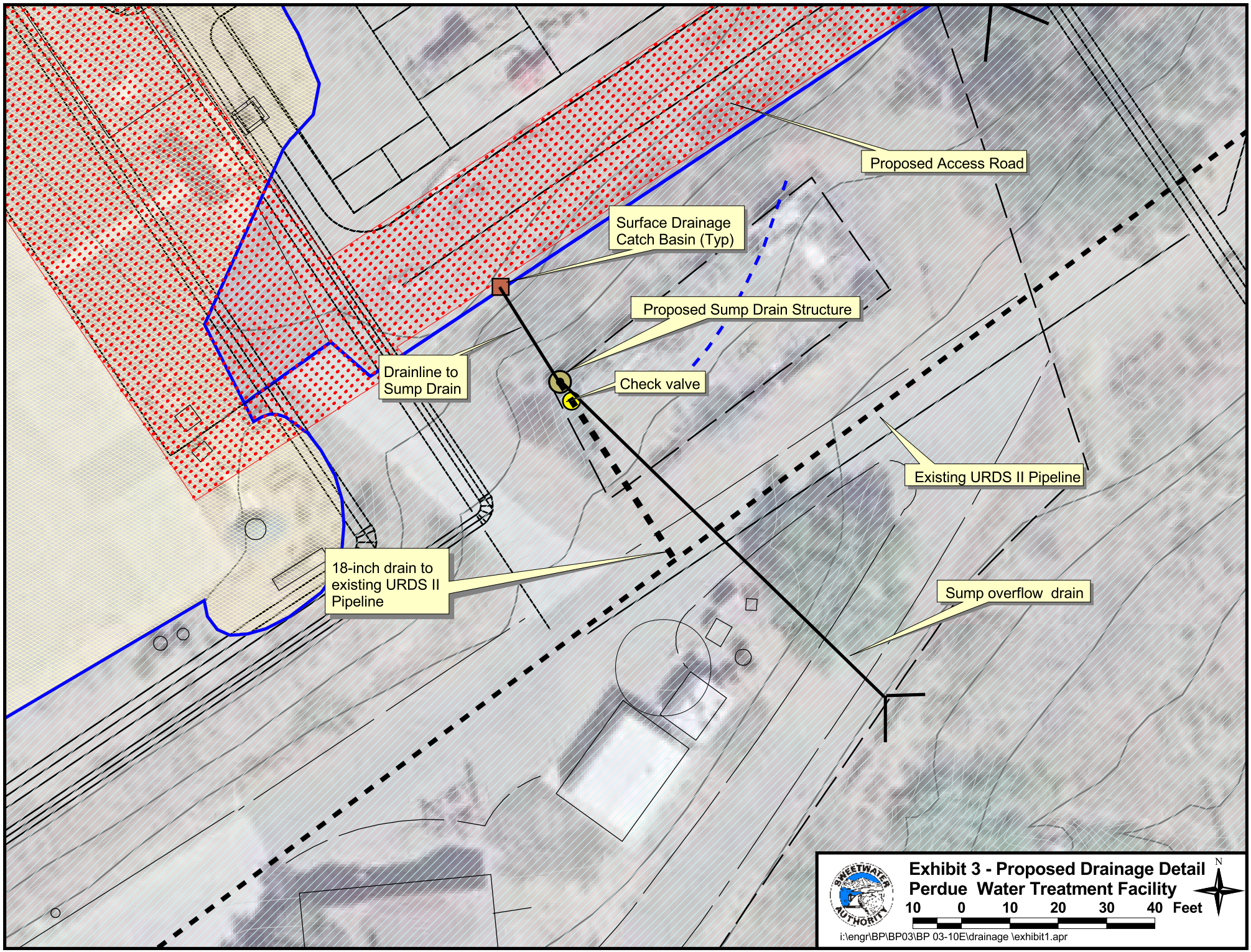
Based on a 2-year storm flow, the pumping system should be sized to pump a maximum flow of 500 gallons per minute (gpm) into the URDS pipeline. The likely URDS tie-in location is approximately 2.6 feet in elevation above the crown of the sump drainpipe. The maximum flow pumped through the existing 20-inch URDS pipeline at this location is approximately 5,000 gpm. Based on a sump depth of 10 feet, the submersible pumps must be able to pump 500 gpm at approximately 12.6 feet of head. Therefore, it is recommended that two submersible pumps be located in the sump, each rated for 250 gpm at 12.5 feet of head.

A float valve would control the level at which each pump turns on, and a float switch would turn off the pumps. The sump would be equipped with an overflow drain, where the float switch would be located. When the storm intensity increases to the point that required pumping cannot be sustained, the flow elevation would rise to the overflow drain, the pumps would be turned off, and flows would enter the 18-inch diameter drain. The excess flows would be discharged through the drain to the high-water level of the reservoir, where riprap would be placed to attenuate velocities during lower reservoir levels. When the water level in the sump recedes below the overflow elevation, the pumps would turn back on and pump the sump dry. More details of this system will be developed during final design of the MF. A schematic of the system is shown on **Exhibit 3**.

Exhibits


Existing Drainage Area
Comprised of Sub-basins 1-3
18 Acres
Perdue Area
8.35 Acres
Robert A. Perdue Water
Treatment Plant
100 Lakeview Road
Spring Valley, CA 91977
Exhibit 1
Perdue Water Treatment Facility
200 0 200 Feet
N
i:\engr\bp\bp 03\bp03-10E\exhibit1.apr


Sub-basin 1
6.57 Acres
Access Rd.
0.83 Acres
V-Ditch
Catch Basin
& Culvert
(Typical)
Sub-basin 2
3.91 Acres
URDS II Pipeline
Perdue Area
8.35 Acres
Robert A. Perdue Water
Treatment Plant
100 Lakeview Road
Spring Valley, CA 91977
Sub-basin 3
7.53 Acres
See Exhibit 3
for detail area.
Exhibit 2 - Proposed Drainage
Perdue Water Treatment Facility
200 0 200 Feet
N
i:\engr\BP\BP03\BP 03-10E\drainage \exhibit1.apr


Proposed Access Road
Surface Drainage Catch Basin (Typ)
Proposed Sump Drain Structure
Drainline to Sump Drain
Check valve
Existing URDS II Pipeline
18-inch drain to existing URDS II Pipeline
Sump overflow drain
SWEETWATER AUTHORITY
Exhibit 3 - Proposed Drainage Detail
Perdue Water Treatment Facility
10 0 10 20 30 40 Feet
N
i:\engr\BP\BP03\BP 03-10E\drainage \exhibit1.apr

Analysis No. 1

WinTR-55 Computer Printouts

(On file at Sweetwater Authority Engineering Department)

Analysis No. 2
WinTR-55 Computer Printouts

(On file at Sweetwater Authority Engineering Department)

APPENDIX C
Biological Resources Report

APPENDIX D
Cultural Resources Inventory

CULTURAL RESOURCES INVENTORY
FOR THE R. PERDUE WATER TREATMENT PLANT UPGRADE AND EXPANSION PROJECT
SAN DIEGO COUNTY, CALIFORNIA

Submitted to:

Sweet Authority
505 Garrett Avenue
Chula Vista, California 91910

Prepared by:

EDAW, Inc.
1420 Kettner Boulevard, Suite 620
San Diego, California 92101
(619) 233-1454

Authors:

Collin Tuthill
and
Tanya Wahoff

Survey Area: Approximately 4.8 acres

USGS 7.5' Quadrangle: National City
Jamul Mountains

January 2006

Keywords: San Diego County, Sweetwater Dam, Perdue Water Treatment Plant, negative cultural resources survey

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ABSTRACT

The Sweetwater Authority (Authority), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (Perdue WTP). Continued urban development in the Authority's service area and plans by Chula Vista and National City for additional population growth have created a need for expanded treatment capacity at the Perdue WTP. The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future.

EDAW, Inc. was contracted by the Authority to conduct environmental services, including cultural resources, for the proposed upgrade and expansion of the Perdue WTP. This report documents the results of an intensive cultural resources survey conducted on 4.8 acres along the northwestern portion of Sweetwater Reservoir in San Diego County. Cultural resources work was conducted under the California Environmental Quality Act.

Background archival information was obtained from the South Coastal Information Center, San Diego State University and the files of the Native American Heritage Commission (NAHC). Information from the NAHC identified no sacred lands or Traditional Cultural Properties within the proposed project boundary. A Native American contact program consisting of an information letter and a response form was conducted. The contact program identified no concerns from the local community regarding the proposed Perdue WTP project.

The intensive pedestrian survey conducted on April 27, 2005, found no cultural resources. The area surveyed included the 3.7-acre Perdue WTP project area, and an additional 1.1 acres southeast of the dam that was subsequently dropped from the project. Neither the archival research nor the survey identified cultural resources within the project area. Based on these results, no further archaeological work is needed. If cultural resources are found during construction, work in that area should be temporarily halted, and the find assessed by a qualified archaeologist. If the find is determined to be eligible for the California Register of Historical Resources, then a research design and data recovery program should be prepared and carried out to mitigate impacts before ground-disturbing construction activities resume.

CHAPTER 1
INTRODUCTION

The cultural resources work performed is consistent with requirements set forth by the California Environmental Quality Act for cultural resources inventories.

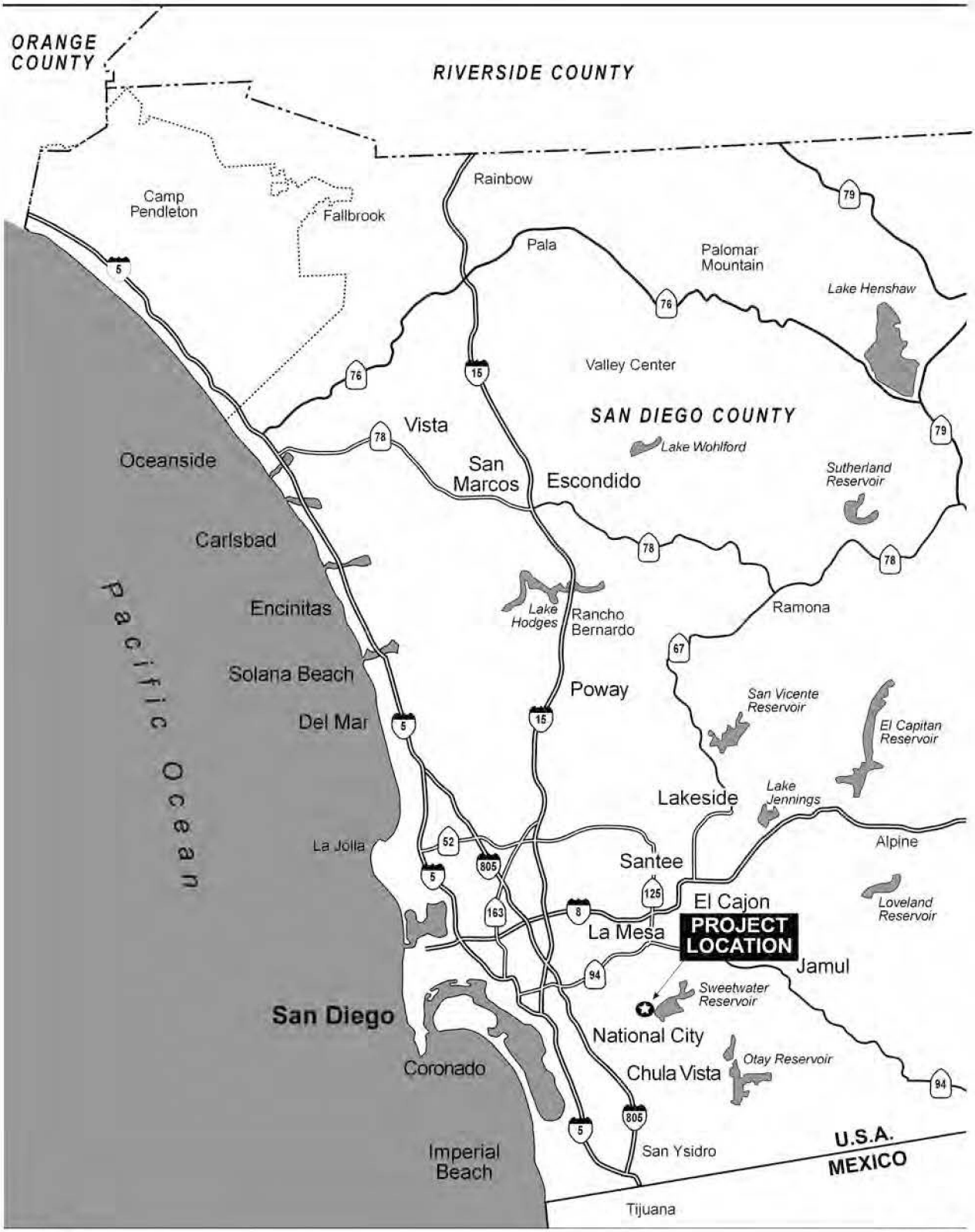
PROJECT DESCRIPTION

The Sweetwater Authority (Authority) is a public agency and water purveyor in the South Bay area of San Diego County serving National City, the western portion of Chula Vista, and the unincorporated community of Bonita. The Authority operates Sweetwater Reservoir and Loveland Reservoir (12 miles northwest) to store water for its 176,210 customers and utilizes the Sweetwater River to transfer water from Loveland Reservoir to Sweetwater Reservoir. In addition to water supplied from the 144-square-mile watershed east of Sweetwater Reservoir, the Authority also receives imported raw water from the Colorado River and northern California via the San Diego County Water Authority Aqueduct that passes through the Robert A. Perdue Water Treatment Plant (Perdue WTP) property.

The Authority is proposing a long-term development plan for the Perdue WTP. The project area is located in southwestern San Diego County (Figure 1). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that the Authority can continue to meet future federal regulations concerning water quality requirements. The upgrades proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide added reliability. The current Perdue WTP is rated for a maximum water treatment flow of 30 million gallons per day (mgd) and the typical annual demand is 20 to 25 mgd. However, continued urban development in the Authority's service area, and plans by Chula Vista and National City for additional population growth, have created a need for expanded treatment capacity at the Perdue WTP.

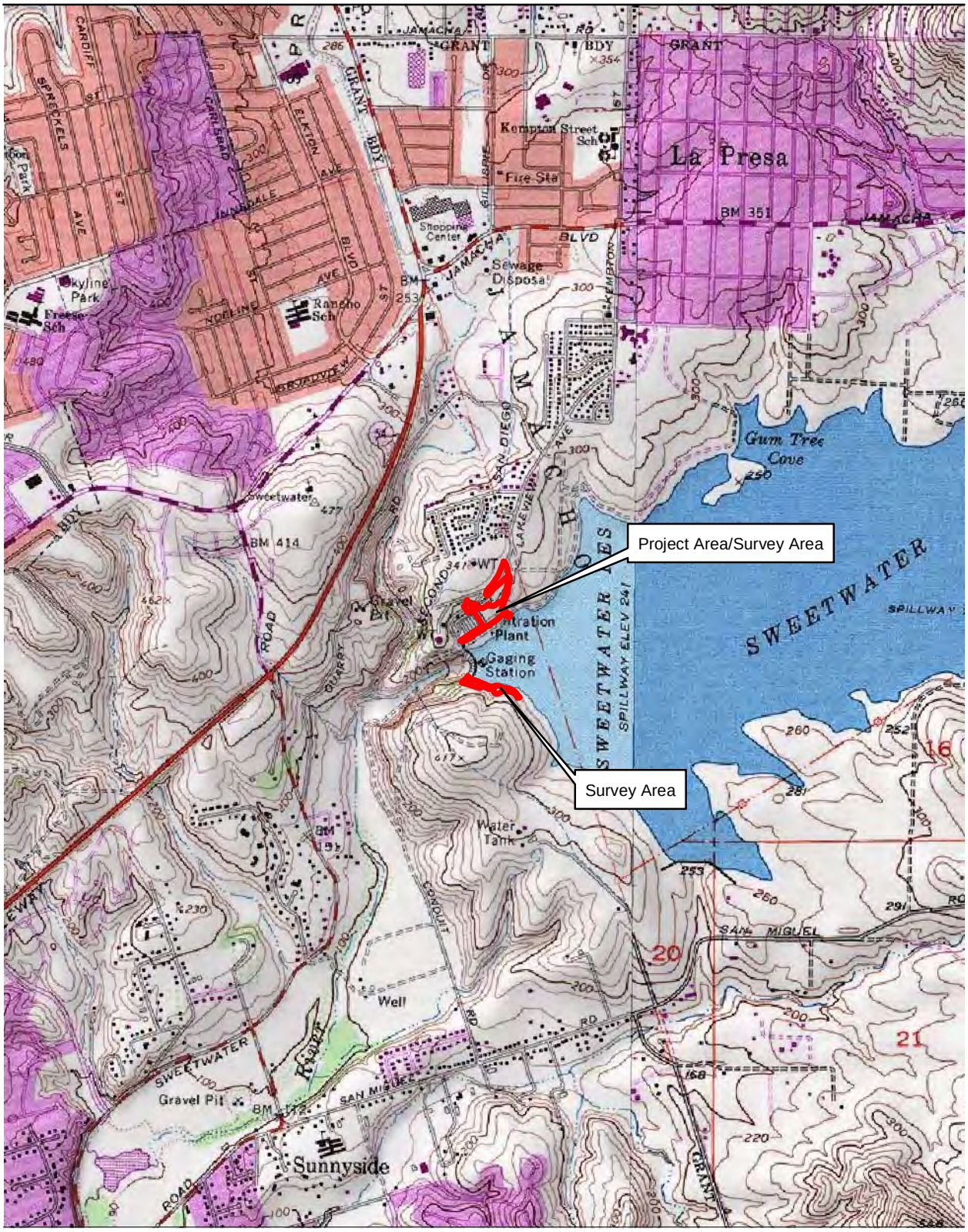
EDAW, Inc. (EDAW) has contracted with the Authority to provide environmental services, including a cultural resources survey, for the proposed Perdue WTP upgrade and expansion project. The Perdue WTP project area is located along the northwestern shoreline of the reservoir immediately north of the historic Sweetwater Dam (Figure 2). This area is in unsectioned portions of Township 17 South, Range 1 West, of the National City, California, 7.5-minute quadrangle map (Figure 3).

In April 2005, a cultural resources survey was conducted for a 4.8-acre area. The survey included the approximately 3.7-acre proposed project area, and an additional approximately 1.1 acres along a dirt road leading to the Perdue WTP on the southwest side of the reservoir. The dirt road is no longer part of the proposed project area.



No Scale

Figure 1
Regional Map



Source: USGS 7.5-Minute Quad Series - National City and Jamul Mountains (1978).

2000 1000 0 2000 Feet

NORTH

Scale: 1 : 24,000; 1 inch = 2,000 feet

Figure 2
Project Location

P:\2004\4k004\GIS\MXD\fig 2 Project_Location.mxd SP83z6f (B.Marraccini) 1/17/05

Source: Sweetwater Authority, 0.5-foot resolution; 2005.

NORTH

300 150 0 300 Feet

Scale: 1 : 3600; 1 inch = 300 feet

Figure 3
Project Area/Survey Areas

P:\2004\4k004\GIS\MXD\fig 3 Project-Survey Areas.mxd SP83z6f (B.Marraccini) 1/17/05

PROJECT PERSONNEL

Rebecca McCorkle Apple, MA, RPA, served as principal investigator and project manager. The field survey was directed by Tanya Wahoff, BA. Collin Tuthill, BA, served as field crew and is primary author for the report. Resumes for project personnel are in Appendix A.

REPORT ORGANIZATION

This report documents prehistoric and historic activity areas within the project area based on archival information and an intensive pedestrian survey. Chapter 1 provides an introduction and project description. Chapter 2 addresses the natural and cultural settings. Chapter 3 reviews previous research near the project area. Chapter 4 discusses EDAW's survey methods and results. Chapter 5 provides management recommendations.

CHAPTER 2
SETTING AND BACKGROUND

ENVIRONMENTAL SETTING

The Sweetwater Reservoir is located in the southwest portion of San Diego County and is bordered by the unincorporated communities of Spring Valley, La Presa, and Sunnyside. It is in the area just immediately south of State Route 54 and just east of its junction with the newly developing State Route 125. The Perdue WTP is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley. The general elevation within the survey area ranges from a minimum of about 260 feet near the shoreline at the foot of the dam, to a maximum of about 320 feet on the terrace to the north in the vicinity of the Perdue WTP.

The project area is situated along the dividing line between the coastal plain and foothills of southern San Diego County, approximately 7 miles from the ocean. The area can be characterized as a series of east-west-trending drainages whose upper elevations reach as much as 620 feet, with valley basins nearer to 100 feet in elevation. These drainages flow into the Sweetwater River, which flows generally southwest into the Pacific Ocean. The project area is within the San Miguel Mountains.

NATURAL SETTING

The project area has been disturbed by previous construction. Vegetation in the portions of the survey area along Lakeview Avenue consist of grass lawns and exotic trees and shrubs. Native vegetation in less-disturbed areas belongs to the coastal sage scrub community. Native plants observed in the vicinity include sagebrush (*Artemisia californica*), California buckwheat (*Eriogonium fasciculatum*), San Diego sunflower (*Virgueria californica*), bunchgrass (*Stipa* sp.), coast barrel cactus (*Ferocactus viridensens*), and deerwood (*Lotus scoparius*).

In general, the coastal sage scrub plant community was not particularly rich in resources exploited by native peoples. However, the Sweetwater River valley would have supported a much richer and more diverse assemblage of plants and animals of use to human occupants.

Terrestrial fauna associated with coastal sage scrub included the California gnatcatcher (*Polioptila californica*), the blue-gray gnatcatcher (*Polioptila caerulea*), American badger (*Taxidea taxus*), California ground squirrel (*Spermophilus beecheyi*), red-tailed hawk (*Buteo jamaicensis*), peregrine falcon (*Falco peregrinus*), ducks (Anatidae), northern harrier (*Circus cyaneus*), jackrabbit (*Lepus californicus*), gopher (*Thomomys bottae*), woodrat (*Neotoma fuscipes*), pocket mouse (*Perognathus fallax*), canyon mouse (*Peromyscus crinitus*), California vole (*Microtus californicus*), coyote (*Canis latrans*), orange-throated whiptail (*Cnemidophorus hyperythus*), cottontail rabbit (*Sylvilagus audubonii*), brush rabbit (*Sylvilagus backmani*), bobcat (*Lynx rufus*), and mule deer (*Odocoileus hemionus*). Rodents and small mammals such as

rabbits formed an important part of the diet of native peoples living in the area. Larger mammals, such as mule deer, were also eaten, although they were not as important to the diet.

CULTURAL SETTING

Prehistory

The prehistoric cultural sequence in San Diego County is generally conceived as comprising three basic periods: the Paleoindian, dated between about 10,500 and 8,000 years ago and manifested by the artifacts of the San Dieguito complex; the Archaic, lasting from about 8,000 to 1,500 years ago and manifested by the cobble and core technology of the La Jollan complex; and the Late Prehistoric, lasting from about 1,500 years ago to historic contact and marked by the appearance of ceramics, small arrow points, and cremation burial practices.

Paleoindian Period

The Paleoindian period in San Diego County is most closely associated with the San Dieguito complex, as identified by Rogers (1938, 1939, 1945). The basal assemblages that make up the San Dieguito complex are characterized by scraper planes, choppers, scraping tools, crescentics, elongated bifacial knives, and well-made leaf-shaped points. The best-dated and most thoroughly investigated San Dieguito component was found at CA-SDI-149 (the C.W. Harris site), located on a terrace overlooking the San Dieguito River 55 km (35 miles) north of the present project area. Here, distinctive San Dieguito materials were found stratigraphically below materials characteristic of the early and late Archaic, and dated to before 9,000 years before present (B.P.). The San Dieguito complex is thought to represent an early emphasis on hunting for subsistence. Aside from the Harris site, however, well-dated San Dieguito assemblages are uncommon, and the relationship between the San Dieguito and the subsequent La Jolla pattern of the Archaic is far from clear.

Archaic Period

The economy of the Archaic period (8000 B.P. to 1500 B.P.) is usually conceived as having a more generalized subsistence pattern, possibly the result of environmental changes and population stress, with an emphasis on gathering shellfish, fish, and vegetal resources. This is indicated by the increased frequency of groundstone implements and the adoption of a mixed cobble/core-based tool assemblage, as well as heavy use of shellfish along the coast. In general, the Archaic artifact assemblage of coastal San Diego County is typified by the La Jolla complex, a local manifestation of the widespread Millingstone horizon. Although major technological change within the Archaic in San Diego County appears limited mainly to the introduction of Elko series projectile points, there seems to have been some reorientation in settlement to inland settings during the latter portion of this period. This settlement shift appears to have occurred around 4,000 years ago and is thought to relate to the final phases of Holocene sea level rise and resultant siltation of the formerly productive coastal lagoons (Gallegos 1987; Warren et al. 1993).

Late Prehistoric Period

The Late Prehistoric period shows evidence of technological changes, as evidenced by the appearance of small projectile points and ceramics. Projectile points commonly found in Late Prehistoric assemblages include Cottonwood Triangular and Desert Side-notched forms, both thought to mark the introduction of bow-and-arrow technology into the region. Ceramics, typically consisting of Tizon Brownware, may have been introduced slightly later than arrow points. These traits, together with the appearance of cremation burials, are thought to derive from desert areas to the east, either by population movement, diffusion, or a combination of both. The reason for the influx of cultural traits from the east is unclear, but desiccation of Lake Cahuilla in the Imperial Valley has been advanced as a partial explanation (Luomala 1978; May 1983). The movement of some of these traits across the Takic/Yuman linguistic boundary, however, suggests that diffusion may also have played an important role in these shifts. In any case, most settlement and subsistence data from San Diego County indicate that Late Prehistoric economy was oriented primarily toward terrestrial habitats, as opposed to the more maritime focus of the Archaic (Christenson 1990, 1992).

The increasing diversification and intensification was likely a result of environmental change, siltation of lagoons, or population increases. In general, it is thought that there was increasing emphasis on plant collection and processing in the Late Prehistoric, as evidenced by abundant bedrock milling stations in the foothill and interior mountains.

Ethnohistory

By the time Spanish colonists began to settle in California, the project area was within the territory of the Kumeyaay people, a group of intermarrying territorial bands, who spoke a Yuman language of the Hokan linguistic stock. The Kumeyaay followed a seasonal gathering cycle, with bands occupying a series of campsites within their territory. Important resources included shellfish, game, acorns, and seeds. Small game was the primary source of protein, but deer were hunted as well. The Kumeyaay were the first Alta California Native American group to be brought into the Mission system, beginning in 1769, but they maintained their cultural identity, to a large degree, into the present. They are a federally recognized Indian tribe with active interest in the management of cultural resources. The Kumeyaay currently occupy a number of reservations in San Diego County, including Jamul, Campo, Sycuan, Viejas, Barona, Mesa Grande, and Santa Ysabel.

Sweetwater Authority and R. Perdue Water Treatment Plant

The history of water service to the South Bay began in 1869 when the Kimball Brothers Water Company was formed, the first in a succession of privately owned water companies until 1977 when Sweetwater Authority was formed through a Joint Powers Agreement between the South Bay Irrigation District and National City. Sweetwater Reservoir was constructed in 1888 when the predominant use of water was for citrus irrigation and drinking water quality was not a major concern. Eventually homeowners desiring a safe and reliable drinking water supply became the largest group of customers, so that by 1961 the 25-mgd Sweetwater Filtration plant had been completed.

The original plant was designed as a direct filtration plant that treated local water stored in Sweetwater Reservoir and consisted of four gravity sand filters, a 10-million-gallon treated water storage tank, and an operations building. In 1976, voters statewide approved the blending of water from northern California's Feather River, which was supplied by the State Water Project, with Colorado River water. Voter approval was given with the condition that all reservoirs along the route would be open to public recreation. With increased recreational access and continued development within the upstream Sweetwater River watershed, bacteriological contamination became a concern at Sweetwater Reservoir. In response to new water quality standards, plans for improvement to the filtration plant were initiated.

In 1987 the refurbishment and expansion of the filtration plant were completed. The improved plant was named after Robert A. Perdue, who had been the Superintendent of Water Quality since the inception of public ownership. The improvements included facilities for pretreatment disinfection, flocculation and sedimentation basins to remove suspended matter, gravity filter basins, a new main control room, a water quality laboratory, and chemical storage and feed buildings.

CHAPTER 3
NATIVE AMERICAN CONSULTATION AND ARCHIVAL RESEARCH

NATIVE AMERICAN CONSULTATION

EDAW contacted the Native American Heritage Commission (NAHC) for a search of their sacred lands files for the Perdue WTP Project. A search of their records did not identify any known sacred lands in or around the project area. The NAHC provided a list of local Native American individuals and organizations that may have knowledge of or an interest in the project area (Appendix B). Letters and response forms were sent to these individuals and organizations to solicit input regarding the proposed project.

EDAW received no written responses to the contact letters, and a series of follow-up phone calls were made. In a follow-up phone call, Mr. Ron Christman of the Kumeyaay Cultural Historic Committee said that he had spoken with the elders regarding the proposed project, and they had no specific concerns. A receptionist for the Mesa Grande Band of Mission Indians indicated that if we had not heard from the Tribal Council by the date of the phone call, they have no specific concerns about the proposed project either. A copy of the letter sent to the NAHC, and a representative letter, response form, and contact list sent to local Native American individuals and organizations are in Appendix B.

ARCHIVAL RESEARCH

A records search obtained in 2003 by ASM Affiliates at the South Coastal Information Center, San Diego State University was provided to EDAW. In 2005, EDAW conducted an update to the records search. The results of these records searches are included in Appendix C. The records search was used to determine the extent to which the area had been previously surveyed and the number and type of cultural resources recorded in the project vicinity. The review included historic maps, the National Register of Historic Places (National Register) and the California Register of Historical Resources (California Register) information for the project area.

Previous Investigations

Of the 26 investigations previously conducted within 1 mile of the Perdue WTP, five were within or adjacent to the proposed project area (Table 1). These investigations include surveys for the Spring Valley Creek Floodplain (Fink 1975), a planned residential development (Underwood 1976), the proposed State Route 125 route (Rosen 1990), and a water pipeline (Baksh 1991). No cultural resources were found during these investigations. Additionally, Mikesell (1998) conducted a historic resources evaluation for the area surrounding the Sweetwater Dam (P-37-016325), which was found eligible for the National Register. The investigation also recorded two quarries and a blasting powder house (P-37-016327), although these were determined ineligible for the National Register (Mikesell 1998).

Table 1. Previous Surveys within or Adjacent to the Project Area

Author	NADB Number	Description	Date
Baksh	1122795	Cultural Resource Survey for San Diego Water Authority Pipeline 4E11, San Diego County	1991
Fink, Gary R.	1120868	Archaeological and Historical Resources of the Spring Valley Creek Floodplain, Spring Valley, California Project No. UJ0129	1975
Mikesell, Stephen D.	1125486	Historic Resource Evaluation Report Sweetwater Dam, NC&O Sweetwater Branch, Sweetwater Quarries 11-SD-125 P.M. 0.0/9.6 & P.M. 9.6/11.2	1998
Rosen, Martin D.	1121364	Archaeological Survey Report for proposed State Route 125 from State Route 905 (near the Second Border Crossing) to State Route 54 (near the Sweetwater Reservoir), San Diego County, California, Caltrans, San Diego	1990
Underwood, Bradley B.	1121522	Archaeology Survey Vista Del Lago Unit #3	1976

Previously Recorded Resources

The archival research revealed that 17 archaeological sites, three built resources, and four isolates have been documented within a 1-mile radius of the project area (Table 2). Of the 17 sites, 15 are prehistoric sites consisting of lithic scatters, lithic and groundstone scatters, lithic and marine shell scatters, bedrock milling, a habitation site, and one quarry. One site that consists of three stacked rock hunting blinds is of possible prehistoric origin. One site has both prehistoric and historic components, including flaked lithics and a glass scatter. Of the built resources, one is a historic period wood-frame house and associated refuse, one is the Sweetwater Dam and spillways, and the other consists of quarries and a powder house building. The four isolated finds include a glass bottle manufactured prior to 1930. Records for the other three isolated finds are missing. None of these resources is within the Perdue WTP project area.

Table 2. Previously Recorded Resources within 1 Mile of the Project Area

Site Number (CA-SDI-)	Description	Date Recorded
I199	Isolate (record missing)	N/A
I202	Isolate (record missing)	N/A
I203	Isolate (record missing)	N/A
I606H	Isolate - glass bottle fragment	1993
4645	Flaked lithic scatter	1974
5129	Surface scatter of lithic tools	1977
5695	Campsite with manos, mano fragments, tools and a lithic scatter	1978, 1989
6842	Quarry site with surface cobbles and flakes	1978
6843	Three stacked rock hunting blinds	1978

Table 2. Previously Recorded Resources within 1 Mile of the Project Area (continued)

Site Number (CA-SDI-)	Description	Date Recorded
7216A, B, C	Surface scatter of lithic tools and flakes	1979
7978	Lithic scatter	1980
9091	Lithic scatter	1981
9583	Bedrock milling	1982
10,177	Lithic scatter	1985
10,986	Lithic and shell scatter	1988
10,991	Lithic scatter and amethyst glass scatter	1988
10,993	Lithic scatter	1988
10,994	Lithic and marine shell scatter	1988
11,452	Lithic and groundstone scatter	1989
11,453	Lithic and groundstone scatter	1989
14,879	1894 woodframe residence and associated refuse	1998
16,883	Bedrock milling, mano fragments	2003
P-37-016325	Sweetwater Dam, stilling dam, intake tower, spillways, and south dike	1998
P-37-016327	Sweetwater quarries and powder house building	1998

Historic Maps

A review was made of the 1944 edition of the USGS 1:31680 National City Quadrangle map, the 1953 edition of the USGS 7.5' National City Quadrangle map, the 1904 and 1930 editions of the USGS 15' San Diego Quadrangle maps, and the 1955 edition of the 1:60000 Historic Stagecoach Routes of San Diego map. All of the above maps show the Sweetwater Dam and roads leading to and from the dam. No structures are shown in the survey area.

CHAPTER 4
SURVEY METHODS AND RESULTS

METHODS

Fieldwork for the project was conducted on April 27, 2005. The survey was conducted by a team of two EDAW archaeologists walking in parallel linear transects spaced 33 to 49 feet (10 to 15 m) apart. A total of 4.8 acres was surveyed for the project, including the current 3.7-acre project area, and an additional 1.1-acre area along a graded dirt road southeast of the dam and spillway that was subsequently dropped from the proposed project (see Figure 3). The ground surface was diligently inspected for evidence of cultural resources. Arroyo banks, road cuts, and rodent hole backdirt were also examined for evidence of buried cultural deposits. Orthotopographic maps of the project vicinity at 1:200-foot scale were utilized during the field survey.

RESULTS

No cultural resources were found during the survey of the proposed Perdue WTP project area (Plate 1). Vegetation was moderately dense throughout the project area owing to recent rains and the proximity to the reservoir. Ground visibility varied from approximately 20 to 40 percent. The portions of the survey area adjacent to the Perdue WTP and the paved road leading into the Perdue WTP were landscaped with grass lawn and exotic shrubs and trees (Plate 2). Most of the survey was over disturbed ground.

Plate 1. Overview of Perdue WTP project area, view to the north.

Plate 2. Landscaped area, view to the south-southeast.

CHAPTER 5
MANAGEMENT RECOMMENDATIONS

The current archival research and survey identified no cultural resources within the proposed project area. No further archaeological work is needed. However, if cultural resources are found during construction, work in that area should be temporarily halted, and the find assessed by a qualified archaeologist. If the find is determined to be eligible for the California Register, then a research design and data recovery program should be prepared and carried out to mitigate impacts before ground-disturbing construction activities resume.

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APPENDIX A
RESUMES OF KEY PERSONNEL

REBECCA MCCORKLE APPLE, MA
Principal
Manager, Cultural Resources Group/Senior Archaeologist

SUMMARY

Expertise with CEQA/NEPA requirements

Experience with Section 106 compliance and mitigation programs

Over 20 years experience in cultural resource management

EDUCATION

MA, Anthropology, San Diego State University, 1990

BA, Anthropology, San Diego State University, 1978

AFFILIATIONS

Society for American Archaeology

Society for California Archaeology

CERTIFICATION

Register of Professional Archaeologists (RPA)

Certified Archaeology Consultant, County of San Diego

ACADEMIC AWARD AND SCHOLARSHIPS

Phi Kappa Phi

Phi Beta Kappa

University Scholar, 1987 and 1988

PAPERS AND PUBLICATIONS

Mapping and Managing Pathway to the Past. Paper presented at the 22nd Annual ESRI International User Conference, San Diego, California (2002).

Introduction to Recent Archeological Investigations at the Salton Sea Test Base, Imperial County California. Proceedings of the Society for California Archaeology Volume 12. Fresno, California (1999).

Introduction to Recent Archaeological Investigations at Salton Sea Test Base, Imperial County, California. Paper presented at the 32nd Annual Meeting for Society for California Archaeology, San Diego (1998).

A Lake Mojave Period Site Near Silver Lake, California (with A. York). Presented at the 26th Annual Meeting of the Society for California Archaeology, Pasadena (1992).

Recent Archaeological Investigations in the North Las Vegas Valley (with J.H. Cleland and M.S. Kelly). In Crossing the Borders: Quaternary Studies in Eastern California and Southwestern Nevada. San Bernardino County Museum Association Special Publication (1991).

Preliminary Project Results of the San Diego County Studies for the Southwest Powerlink Transmission Project. Presented at the 17th Annual Meeting of the Society for California Archaeology, San Diego (1983).

Rebecca Apple has over 20 years of experience in cultural resource management and serves as senior archaeologist for EDAW. Her experience includes managing cultural resources compliance efforts for large complex projects. She is knowledgeable in the procedures and guidelines associated with implementation of NHPA and CEQA. Ms. Apple has managed numerous cultural resource projects, including prehistoric, historic, and ethnographic studies. She has directed inventories, evaluations, data recovery efforts, and monitoring programs. She has also prepared management plans and conducted feasibility studies. Her work frequently includes consultation with municipal, state, and federal agencies, as well as Native American representatives and the public. As part of interdisciplinary teams, Ms. Apple has managed cultural resources investigations and authored cultural resource sections for ISs, EAs, EIRs, and EISs. Her experience includes cultural resource investigations for pipelines, transmission lines, power plants, highways, landfills, water resource facilities, military installations, and commercial and residential development.

REPRESENTATIVE PROJECTS

Balboa Park Wastewater Treatment, San Diego County, CA
Archaeologist
CLIENT: City of San Diego
Participated in cultural resource documentation for a facility siting study.

Emergency Storage Project, San Diego County, CA
Resource Manager
CLIENT: San Diego County Water Authority
Cultural Resources Evaluation Program and Treatment Program. EDAW assisted SDCWA with Native American consultation, implementation of a programmatic agreement, and coordination with ACOE. Project involved evaluation of over 20 cultural including San Vicente Dam. Under an Historic Properties Treatment Plan prepared by EDAW, research designs were prepared and carried out for prehistoric and historic period resources. Treatment measures included data recovery, site stabilization, and preparation of Historic American Engineering Record documentation for San Vicente Dam.

Mission Valley Water Reclamation Plant, San Diego County, CA
Resource Manager
CLIENT: City of San Diego
Archaeological testing and monitoring program in area of potential archaeological sensitivity.

North City Water Treatment Plant, San Diego, CA
Resource Manager
CLIENT: City of San Diego Water Department
Cultural resource component of the North City Water Treatment Plant EIR. Project included survey and limited testing.

North Metro Interceptor Sewer, San Diego County, CA
Resource Manager
CLIENT: City of San Diego
Cultural resource investigations for constraints analysis of proposed sewer alignments.

REBECCA MCCORKLE APPLE, MA

Data Recovery for Goat Canyon Retention Basin Border Field State Park, San Diego County, CA
Cultural Resources Project Manager
CLIENT: State of California Department of Parks and Recreation
EDAW conducted data recovery under stringent time constraints based on wild life issues and construction schedule. Excavation of 50 units at CA-SDI-16,047 Locus B indicated that the site was a buried temporary camp whose occupants exploited littoral, near-shore and terrestrial subsistence resources. EDAW's data recovery investigations successfully collected data important in local and regional prehistory. The identification of a single component locus dating to the Archaic-Late transition is an important contribution.

SEMPRA On-call Cultural Services, CA
Resource Manager
CLIENT: SEMPRA
Resource manager for cultural resource task orders. Most recent task order has dealt with artifact curation for a City project.

SR-56, San Diego County, CA
Resource Manager
CLIENT: City of San Diego
Cultural resource evaluation program for the SR-56 EIR. Evaluated 16 sites along two alternative freeway alignments.

La Costa Avenue/I -5 Interchange, San Diego County, CA
Project Archaeologist
CLIENT: Caltrans
Directed an archaeological survey of proposed interchange improvements in the City of Carlsbad. The project requires close coordination with City and Caltrans staff.

SA 680/SF 728 Roadway Project Environmental Studies/EIR, San Diego County, CA
Project Archaeologist
CLIENT: County of San Diego
Directed the test excavation and NRHP evaluation of four sites on the proposed project alignment. These investigations addressed the potential association of the sites with the Harris Site Complex.

Southwest Powerlink 500-kV Transmission Line EIR/EIS, Imperial and San Diego Counties, CA
Resource Manager
CLIENT: San Diego Gas & Electric
Participated in Section 106 compliance activities, including data recovery, analysis, and report preparation.

Indefinite Quantity Contract for Cultural Resource Services, CA and AZ
Project Manager
CLIENT: U.S. Navy, Southwest Division
Contract manager for multiple task orders on a variety of projects involving archaeological surveys and archaeological evaluations throughout California and Arizona. Tasks include managing budget, overseeing staff, acting as point of contact, and preparation of final reports.

TANYA WAHOFF
Associate Archaeologist/Lithic Technology Specialist

SUMMARY
Archaeological excavation, survey, laboratory analysis, lithic analysis, data management, reporting, and archival research background

Experience in California, Nevada, Arizona, Utah, Colorado, and southern Oregon

Survey, testing, and data recovery project experience

EDUCATION
BA, Anthropology, University of California, Santa Barbara, 1980

AFFILIATIONS
Society for California Archaeology

Society for American Archaeology

CERTIFICATION
40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Course

With 20 years of archaeological experience, Tanya Wahoff possesses expertise in cultural resources management, prehistoric archaeology, historical archaeology, and laboratory analyses. During her professional career, Ms. Wahoff has participated in and supervised numerous archaeological surveys, site evaluations, archaeological monitoring, data recovery, and laboratory analyses for projects throughout the western United States. Ms. Wahoff has become conversant with procedures for both the National Historic Preservation Act (NHPA) and the California Environmental Quality Act (CEQA).

Ms. Wahoff 's extensive experience in laboratory analysis includes historic artifacts, groundstone, shell beads, and identification of both freshwater and marine shell - with a special emphasis on flaked lithics. She has conducted lithic analysis for projects involving numerous large prehistoric quarries and lithic reduction sites, including projects situated on or adjacent to Sugarloaf Mountain, a massive obsidian quarry located near the Owens Valley in eastern California. The lithic analysis for many of these projects focused on the identification of reduction and manufacturing techniques based on technomorphological attribute analysis as described by Don Crabtree. Ms. Wahoff has also participated in lithic workshops directed by Steven Shackley (Lowie Museum) and John Fagan (Oregon State University).

Ms. Wahoff is actively involved in public outreach, and has given numerous lectures to both the public and professional community on the subject of archaeology.

REPRESENTATIVE PROJECTS

Emergency Storage Project, San Diego County, CA
Field Director/Monitoring Supervisor
CLIENT: San Diego County Water Authority
Conducted and directed supplemental surveys and prepared technical reports in support of the Emergency Water Storage Project and supervised construction monitoring for an ongoing, multiyear project in northern San Diego County. Conducted lithic analysis and co-authored the evaluation report for CA-SDI-586 and Ca-SDI-10,920 at Lake Hodges. Crew chief for testing, and conducted the lithic analysis for and data recovery at fourteen sites on the San Vicente Reservoir. Co-authored the data recovery report.

Hale Avenue Resource Recovery Facility (HARRF) Project, Escondido, CA
Field Director
CLIENT: City of Escondido
Directed excavation of shovel test pits (STPs) along a proposed access road for proposed expansions to HARRF in northern San Diego County, California. Supervised archaeological monitoring during construction of the access road adjacent to prehistoric site CA-SDI-8280.

Pump Station Number 62 Project, San Diego County, CA
Project Manager
CLIENT: City of San Diego
Project manager for a proposed pump station and improvements to an access road in the community of Rancho Peñasquitos, directed the field survey and wrote the technical report.

TANYA WAHOFF

Sewer Group Job 672, San Diego County, CA
Cultural Resources Monitoring Supervisor
CLIENT: City of San Diego
Supervisor for cultural resources monitoring of sewer line improvements in the Mission Hills area of the City of San Diego, and wrote the monitoring report.

Sorrento Valley Trunk Sewer and Pump Station Number 5, San Diego County, CA
Project Archaeologist
CLIENT: City of San Diego
Directed cultural resource investigations for a proposed trunk sewer and pump station in the Sorrento Valley area of the city of San Diego, including an archival search and field survey, and wrote the report.

Friars Road Water Treatment Plant Project, San Diego, CA
Field Director/Lithic Technology Specialist
CLIENT: City of San Diego
Conducted survey and site inventory, wrote the testing plan for CA-SDI-15,600, directed testing, conducted lithic analysis, and wrote the technical report.

North City Water Treatment Plant Project, San Diego County, CA
Project Archaeologist/Historic Research Assistant
CLIENT: City of San Diego
Directed survey and evaluation of a historic site, conducted historic research, and wrote the technical report and portions of the EIR for a proposed water treatment plant in the City of San Diego.

P5EII Water Pipeline Expansion, San Diego County, CA
Staff Archaeologist/Lithic Technology Specialist
CLIENT: San Diego County Water Authority
Conducted data recovery at prehistoric archaeological site CA-SDI-13,504. Participated in cataloging, conducted shell speciation and lithic analysis, and wrote portions of the report.

State Route 56 EIR Archaeological Survey, San Diego County, CA
Water Screening Supervisor/Lithic Technology Specialist
CLIENT: City of San Diego
Conducted archaeological testing, including Phase II significance determination; participated in lithic analysis; and wrote marine shell portion of the report.

Eastern Sierra Hydroelectric Project, Inyo County, CA
Staff Archaeologist/Lithic Technology Specialist
CLIENT: Southern California Edison
Conducted testing, evaluation, and lithic analysis of 21 prehistoric and historic sites in the eastern Sierra Nevada.

Coronado 69 kV Utilities Relocation Area Monitoring, San Diego, CA
Project Manager/Monitoring Supervisor/Field and Laboratory Director
CLIENT: Sempra Energy and Utilities
Supervised archaeological monitoring of trenching for a 69 kV cable and directed evaluation of two buried historic features discovered during monitoring. Coordinated with Sempra. Primary author of the monitoring and evaluation report.

COLLIN TUTHILL
Staff Archaeologist

EDUCATION

BA, Anthropology, San Diego State University, 2002

Mr. Tuthill has 6 years of archaeological experience in Southern California. This includes document research, construction monitoring, surveying, excavation of both historic and prehistoric sites in San Diego County, and laboratory analyses. One of Mr. Tuthill's primary responsibilities has been the accessioning of materials into the lab, artifact analysis, data entry, and preparation of artifacts for curation. His duties have also included the supervision of interns in the lab and the writing of sections of reports. He has experience working in Microsoft Word and WordPerfect and has worked on databases in both Paradox and in Excel.

WORK EXPERIENCE

LMXU, San Diego, CA
Archaeological Technician
CLIENT: City of San Diego
Participated in excavation, conducted laboratory analyses and created prehistoric artifact catalog.

Wire Mountain Housing, Oceanside, CA
Archaeologist
CLIENT: Hunt Building Company
Construction monitoring

Caltrans 11 New Headquarters, San Diego, CA
Archaeologist
CLIENT: PSB Environmental Services Section
Construction monitoring, laboratory analyses

Old Town Plaza del Pasado, San Diego, CA
Archaeologist
CLIENT: Heritage Architecture & Planning
Conducted an archaeological excavation in the field

SR125, San Diego, CA
Archaeologist
CLIENT: San Diego Expressway, L.P. (SDELP)
Survey and site relocation

Ballpark, San Diego, CA
Archaeologist
CLIENT: Center City Development Corp
Conducted laboratory analyses, created historic artifact catalog

Coronado, San Diego, CA
Archaeologist
CLIENT: Parsons Brinckerhoff Cons. Services
Conducted laboratory analyses, created historic artifact catalog

Border Fields State Park, San Diego, CA
Archaeologist
CLIENT: California State Parks
Conducted laboratory analyses, created prehistoric artifact catalog

COLLIN TUTHILL

DO7, Oceanside, CA
Archaeological Technician
CLIENT: SWDIV
Conducted laboratory analyses, created prehistoric artifact catalog

DO15, Oceanside, CA
Archaeological Technician
CLIENT: SWDIV
Conducted laboratory analyses, created prehistoric artifact catalog

North Baja Gas Pipeline Project, Riverside and Imperial Counties, CA
Archaeological Technician
CLIENT: Foster Wheeler Environmental Corporation
Conducted laboratory analyses and created both historic and prehistoric artifact catalogs.

San Clemente Island EIR, Los Angeles County, CA
Archaeological Technician
CLIENT: SRS
Conducted laboratory analyses, created prehistoric artifact catalog.

Emergency Storage Project, San Diego County, CA
Archaeological Technician
CLIENT: San Diego County Water Authority
Conducted laboratory analyses, created both historic and prehistoric artifact catalogs.

EDAW, Inc. – 2001 to present
Archaeologist and Archaeological Technician
Work experience includes: Surveying, excavating, monitoring, and cataloging of artifacts; Excavation of 6 prehistoric sites on Marine Corps Base Camp Pendleton; Construction monitoring at Hellman Ranch Specific Plan Area, Seal Beach; Survey at Escondido Creek; Survey along I-5 at Manchester Avenue; Survey at Ormesa Geothermal facility, in Imperial County; Data recovery excavation at CA-SDI-10,307, Torrey Highlands Village Center, San Diego; Survey and excavation at Lake Hodges; Survey and excavation at San Vicente Reservoir.

Tierra Environmental Services – 1999 to 2000
Archaeological Technician
Responsibilities included excavating and water screening.

RELEVANT EXPERIENCE

San Diego Museum of Man
Interned in 2002.

Anthropology Department, SDSU
Interned in Collections Management in Spring 2002.

Anthropology Department, SDSU
Lost Valley Field School in Summer 1998.

APPENDIX B
NATIVE AMERICAN CONSULTATION

NATIVE AMERICAN CONTACT PROGRAM MAILING LIST
04080004.01 R. Purdue Water Treatment Plant EIR

Clifford LaChappa, Chairperson
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Lucille Richard, EPA Specialist
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Steve Banegas, Cultural Resources Coordinator
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Sue Thomas, Tribal Administrator
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Harlan Pinto, Chairperson
Ewiiaapaayp Tribal Office
P.O. Box 2250
Alpine, CA 91903-2250

James Robertson, Cultural Resources Coordinator
Ewiiaapaayp Tribal Office
P.O. Box 2250
Alpine, CA 91903-2250

Michael Garcia, Environmental Coordinator
Ewiiaapaayp Tribal Office
P.O. Box 2250
Alpine, CA 91903-2250

Will Macklin, Tribal Administrator
Ewiiaapaayp Tribal Office
P.O. Box 2250
Alpine, CA 91903-2250

Rebecca Osuna
Inaja Band of Mission Indians
309 S. Maple Street
Escondido, CA 92025

Leon Acevedo, Chairperson
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

Ron Christman
Kumeyaay Cultural Historic Committee
56 Viejas Grade Road
Alpine, CA 92001

Howard Maxcy, Chairperson
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, CA 92070

Allen E. Lawson, Chairperson
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, CA 92082

Bernice Paipa, Cultural Resources Coordinator
Santa Ysabel Band of Diegueno Indians
P.O. Box 937
Boulevard, CA 91905

Brandie Taylor, Tribal Administrator
Santa Ysabel Band of Diegueno Indians
P.O. Box 130
Santa Ysabel, CA 92070

Johnny Hernandez, Spokesman
Santa Ysabel Band of Diegueno Indians
P.O. Box 130
Santa Ysabel, CA 92070

Rodney Kephart, Environmental Coordinator
Santa Ysabel Band of Diegueno Indians
P.O. Box 130
Santa Ysabel, CA 92070

Danny Tucker, Chairperson
Sycuan Band of Mission Indians
5459 Dehesa Road
El Cajon, CA 92021

Anthony Pico
Viejas Band of Mission Indians
P.O. Box 908
Alpine, CA 91903

November 2, 2004

Clifford LaChappa, Chairperson
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Dear Mr. LaChappa:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Lucille Richard, EPA Specialist
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Dear Ms. Richard:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Steve Banegas, Cultural Resources Coordinator
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Dear Mr. Banegas:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Sue Thomas, Tribal Administrator
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Dear Ms. Thomas:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Harlan Pinto, Chairperson
Ewiiaapaayp Tribal Office
P.O. Box 2250
Alpine, CA 91903-2250

Dear Mr. Pinto:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

James Robertson, Cultural Resources Coordinator
Ewiiaapaayp Tribal Office
P.O. Box 2250
Alpine, CA 91903-2250

Dear Mr. Robertson:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Michael Garcia, Environmental Coordinator
Ewiiaapaayp Tribal Office
P.O. Box 2250
Alpine, CA 91903-2250

Dear Mr. Garcia:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Will Macklin, Tribal Administrator
Ewiiaapaayp Tribal Office
P.O. Box 2250
Alpine, CA 91903-2250

Dear Mr. Macklin:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Rebecca Osuna
Inaja Band of Mission Indians
309 S. Maple Street
Escondido, CA 92025

Dear Ms. Osuna:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Leon Acevedo, Chairperson
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

Dear Mr. Acevedo:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Ron Christman
Kumeyaay Cultural Historic Committee
56 Viejas Grade Road
Alpine, CA 92001

Dear Mr. Christman:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Howard Maxcy, Chairperson
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, CA 92070

Dear Mr. Maxcy:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Allen E. Lawson, Chairperson
San Pasqual Band of Mission Indians
P.O. Box 365
Valley Center, CA 92082

Dear Mr. Lawson:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

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Response form
Stamped reply envelope

November 2, 2004

Bernice Paipa, Cultural Resources Coordinator
Santa Ysabel Band of Diegueno Indians
P.O. Box 937
Boulevard, CA 91905

Dear Ms. Paipa:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Brandie Taylor, Tribal Administrator
Santa Ysabel Band of Diegueno Indians
P.O. Box 130
Santa Ysabel, CA 92070

Dear Ms. Taylor.:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
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Stamped reply envelope

November 2, 2004

Johnny Hernandez, Spokesman
Santa Ysabel Band of Diegueno Indians
P.O. Box 130
Santa Ysabel, CA 92070

Dear Mr. Hernandez:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Rodney Kephart, Environmental Coordinator
Santa Ysabel Band of Diegueno Indians
P.O. Box 130
Santa Ysabel, CA 92070

Dear Mr. Kephart:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Danny Tucker, Chairperson
Sycuan Band of Mission Indians
5459 Dehesa Road
El Cajon, CA 92021

Dear Mr. Tucker:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

November 2, 2004

Anthony Pico
Viejas Band of Mission Indians
P.O. Box 908
Alpine, CA 91903

Dear Mr. Pico.:

The Sweetwater Authority (SWA), a public agency and water purveyor in the South Bay area of San Diego County, is proposing a long-term development plan for the Robert A. Perdue Water Treatment Plant (WTP). The proposed plan will address all modifications that will be required for capacity requirements and water quality regulations for the foreseeable future. The upgrades that are planned for the Perdue WTP are intended to provide not only safe and reliable water but to also ensure that SWA can continue to meet the future Federal regulations concerning water quality requirements. The upgrades that are proposed for the plant provide the necessary facilities to meet and exceed these requirements as well as provide for added reliability. The project area is located in the southwest portion of San Diego County. The Robert A. Perdue Water Treatment Plant is located in the northwesterly corner of the Sweetwater Reservoir property in the unincorporated community of Spring Valley (see attached figure).

The purpose of this letter is to notify you of this project and to solicit your input. We would like to know if you have any questions, comments, or concerns. A project map, a reply form, and a self-addressed stamped envelope have been included for your convenience. Providing comments now does not limit your ability to comment at a later time. Please write or call by November 19, 2004 so that we may include your views in our report.

Sincerely,

Cheryl Bowden-Renna
Staff Archaeologist

Enclosures: Map
Response form
Stamped reply envelope

APPENDIX C
RECORDS SEARCH

(Bound Separately)

Restricted Information – on file with the Sweetwater Authority

APPENDIX E
Geotechnical Evaluation

GEOTECHNICAL EVALUATION
PERDUE WATER TREATMENT
PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PREPARED FOR:
Sweetwater Authority
100 Lakeview Avenue
Spring Valley, California 91977

PREPARED BY:
Ninyo & Moore
Geotechnical and Environmental Sciences Consultants
5710 Ruffin Road
San Diego, California 92123

November 8, 2005
Project No. 105602001

November 8, 2005
Project No. 105602001

Mr. Scott McClelland, P.E.
Sweetwater Authority
100 Lakeview Avenue
Spring Valley, California 91977

Subject: Geotechnical Evaluation
Perdue Water Treatment Plant Upgrades
Spring Valley, California

Dear Mr. McClelland:

In accordance with your authorization, we have prepared this geotechnical evaluation report for the proposed improvement project at the Perdue Water Treatment Plant in Spring Valley, California. This report presents our geotechnical findings, conclusions, and recommendations regarding the proposed improvements.

We appreciate the opportunity to be of service on this project. If you have any questions or comments regarding our report, please contact our project manager, Mr. Emil Rudolph.

Sincerely,
NINYO & MOORE

Gregory T. Farrand, C.E.G.
Principal Geologist

Erik Olsen, G.E.
Chief Geotechnical Engineer

BTM/ER/RI/GTF/EO/yye

Distribution: (6) Addressee

REGISTERED GEOLOGIST
GREGORY T. FARRAND
No. 1007
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
ERIK OLSEN
No. 2218
Exp. 3/31/06
GEOTECHNICAL
STATE OF CALIFORNIA

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Appendix B – Laboratory Testing
Appendix C – Seismic Refraction Velocity Profiles
Appendix D – Typical Earthwork Guidelines
Appendix E – Corrosion Analysis

1. INTRODUCTION

In accordance with your request, we have performed a geotechnical evaluation for the Perdue Water Treatment Plant Upgrades project. The project study area is located in the southeast portion of the Perdue Water Treatment Plant in Spring Valley, California (Figure 1). The purpose of this evaluation was to provide design recommendations regarding the geotechnical aspects of the proposed project. This report presents the results of our background review, subsurface evaluation, laboratory testing, geotechnical analyses, our conclusions regarding the geotechnical conditions along the subject alignment, and our recommendations for design.

2. SCOPE OF SERVICES

Ninyo & Moore's scope of services for this project included the following:

- Review of in-house data on the alignment vicinity and readily available published geotechnical literature, including geologic maps, geologic reports, and aerial photographs.
- Geologic reconnaissance of the improvement area.
- Coordination and mobilization for the subsurface exploration. Mark-out of existing underground utilities was conducted through Underground Service Alert and Sweetwater Authority staff.
- Performing a subsurface evaluation consisting of the excavating, logging, and sampling of six borings to evaluate the subsurface soils. In addition, we performed a geophysical survey consisting of four seismic refraction traverses to evaluate rippability characteristics.
- Performing laboratory testing on selected samples to evaluate in situ density and moisture content, grain size distribution, expansion index, and corrosivity.
- Geotechnical analysis of the data obtained.
- Preparing this geotechnical report presenting our findings, conclusions, and recommendations for the design and construction of the proposed project.

3. SITE DESCRIPTION

The site is located on the grounds of the Perdue Water Treatment Plant northwest of the Sweetwater Reservoir. The grounds consist of a multi-acre parcel with undeveloped portions covered

with sparse shrubs and grasses, and developed portions containing masonry brick buildings, subterranean concrete tanks, subterranean pipe systems, above-grade steel tanks, and paved access roads. The surrounding area use is generally residential and open space preserve. The Second San Diego Aqueduct passes approximately 1/10 mile west of the site. Elevations along the improvement area range from a high of approximately 305 feet Mean Sea Level (MSL) to a low of approximately 250 feet MSL.

4. PROJECT DESCRIPTION

It is our understanding that the subject project includes a proposed membrane facility at or near existing grade and multiple new pipeline segments. The pipeline segments will extend from the existing floculation/sedimentation basin southeast towards the proposed membrane facility, east of the existing clearwell (Figure 2). Pipelines are anticipated up to approximately 15 feet in depth. The membrane facility will be constructed near grade and include cuts in the existing material. Additional shallow pipelines are proposed in the northeast and southwest corners of the proposed membrane facility. A powder activated charcoal (PAC) storage unit will be constructed in the base of the slope northwest of the flocculation/sedimentation basin and consist of a concrete pad with retaining walls.

5. FIELD EXPLORATION AND LABORATORY TESTING

Five borings were drilled on May 20, 2005 using 8-inch diameter, hollow-stem augers on a CME-75 truck-mounted drill rig. The borings were excavated to depths of up to approximately 17 feet in depth. Relatively undisturbed and bulk samples were collected from the borings. The approximate locations of the borings are shown on Figure 2. The boring logs are presented in Appendix A.

Four seismic refraction traverses were performed at the locations depicted on Figure 2. The survey was performed using a 12-channel, digital seismograph with a 10-pound hammer as the energy source. The results of our seismic refraction traverses are presented in Appendix C. A more detailed explanation of the results is included below.

Laboratory testing of representative soil samples included in-situ moisture content and dry density, gradation analyses, expansion index, and soil corrosivity. The results of the in-situ moisture content and dry density tests are shown at the corresponding sample depth on the boring logs in Appendix A. The results of the other laboratory tests performed are presented in Appendix B.

6. GEOLOGY AND SUBSURFACE CONDITIONS

Our findings regarding regional and local geology, including faulting and seismicity, landslides, and groundwater conditions are provided in the following sections.

6.1. Regional Geologic Setting

The project area is situated in the San Diego County section of the Peninsular Ranges Geomorphic Province. This geomorphic province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California (Norris and Webb, 1990). The province varies in width from approximately 30 to 100 miles. In general, the province consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the southern California batholith. The portion of the province in San Diego County, in which the project area is situated, generally consists of uplifted and dissected Cretaceous-age granitic rock.

The Peninsular Ranges Province is traversed by a group of sub-parallel faults and fault zones trending roughly northwest. Several of these faults are considered active faults. The Whittier-Elsinore, San Jacinto, and San Andreas faults are active fault systems located northeast of the project area and the Agua Blanca-Coronado Bank, San Clemente, and Rose Canyon faults are active faults located west of the project area. Major tectonic activity associated with these and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement. Further discussion of faulting relative to the site is provided in the Faulting and Seismicity section of this report.

6.2. Site Geology

Geologic units encountered during our subsurface evaluation include fill, weathered volcanics, and Jurassic-age metavolcanic rock. Generalized descriptions of the earth units encountered are provided in the subsequent sections. More detailed descriptions are provided on the boring logs in Appendix A.

6.2.1. Fill

Fill was encountered in borings near the southern portion of the proposed membrane facility, namely B-3 and B-4, up to approximately 4 feet in depth. Shallow fill material also capped the area of the boring B-1 and B-2. In general, these materials consisted of brown damp, loose to dense, silty fine to medium sandy gravel with cobbles up to 8 inches in diameter.

6.2.2. Weathered Volcanics

Weathered volcanics (weathered metavolcanic rock) was encountered mantling the site beneath fill materials. In general, the materials excavated as yellowish to light brown, dry to moist, silty to clayey fine sand to gravel and are derived from intensely to moderately weathered volcanic rock.

6.2.3. Santiago Peak Volcanics

Metavolcanic rock of the Santiago Peak Volcanics was observed in our reconnaissance to underlie the site, as well as encountered in our borings. Outcrops are exposed in cuts west of the proposed membrane facility, east of boring B-2, and southwest of boring B-5. The metavolcanic rock was fresh to slightly weathered, very strong, hard, massive to jointed and fractured crystalline rock. Joint openings varied from very narrow (<0.05 in.) to wide (>0.5 in.), and some joint openings were partially in filled with sand to silt.

6.3. Groundwater

Groundwater was not encountered in our borings. Based on the results of our borings and our experience, we anticipate that the groundwater table in the area is below the depths of

the proposed improvements. However, due to the jointed and fractured nature of the volcanics underlying the site, seepage should be expected. Fluctuations in the groundwater level or perched groundwater may occur due to variations in ground surface topography, subsurface geologic conditions and structure, rainfall, irrigation, and other factors.

6.4. Rippability

Four seismic refraction traverses were performed at the locations depicted on Figure 2. The survey was performed using a 12-channel, digital seismograph with a 10-pound hammer as the energy source. The results of our seismic refraction traverses are presented in Appendix C.

The seismic refraction method uses first-arrival times of refracted seismic waves to determine the thicknesses and seismic velocities of subsurface layers. Seismic waves generated at the surface are refracted at boundaries separating materials of contrasting velocities. The seismic waves refracted back to the surface are then detected by a series of surface geophones and recorded with a seismograph. The travel times of the seismic waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

The refraction method assumes that subsurface velocities (and therefore material density) increase with depth. A layer having a velocity lower than that of the layer above will not be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity can also result in the misinterpretation of the subsurface conditions.

In general, seismic wave velocities can be correlated to material density and/or rock hardness. The relationship between rippability and seismic velocity is empirical and assumes a homogenous mass. Some areas of differing composition, texture, or structure may affect both the measured data and the actual rippability of the mass. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

The following rippability chart (Table 1) is based on our experience with similar materials. It assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock characteristics, such as weathering patterns, fracture spacing and orientation, play a significant role in evaluating rock rippability. These characteristics may also vary with location and depth.

Table 1 – Rippability Classification

0 to 2000 ft/s	Easy Ripping
2000 to 4000 ft/s	Moderate Ripping
4000 to 5500 ft/s	Difficult Ripping, Possible Blasting
5500 to 7000 ft/s	Very Difficult Ripping, Probable Blasting
Greater than 7000 ft/s	Blasting Generally Needed

For trenching operations, the rippability figures should be scaled downward. For example, velocities as low as 3,500 feet per second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in a narrow trench, should be anticipated. The above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

Table 2 lists the average velocities and range of depths calculated from the seismic refraction traverses conducted during this evaluation. The approximate locations of the seismic refraction traverses are shown on Figure 2. Layer profiles are also included in Appendix C. Please note the vertical scale changes for the profiles.

As a general rule of thumb, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the refraction line. The lengths of the seismic refraction lines are listed with their interpretations.

Table 2 – Seismic Traverse Results

Traverse No. And Length	Velocity (feet/second)	Approximate Depth to Bottom of Layer (feet)	Rippability*
SL-1 120 feet	Layer 1 = 1,940 Layer 2 = 9,950	6-9 ---	Easy to Moderate Ripping Blasting Generally Needed
SL-2 120 feet	Layer 1 = 1,940 Layer 2 = 5,570 Layer 3 = 16,800	5-9 36-52 ---	Easy to Moderate Ripping Very Difficult Ripping, Probable Blasting Blasting Generally Needed
SL-3 120 feet	Layer 1 = 1,940 Layer 2 = 5,570 Layer 3 = 16,800	4-8 24-34 ---	Easy to Moderate Ripping Very Difficult Ripping, Probable Blasting Blasting Generally Needed
SL-4 95 feet	Layer 1 = 1,940 Layer 2 = 5,570 Layer 3 = 16,800	2-9 29-40 ---	Easy Very Difficult Ripping, Probable Blasting Blasting Generally Needed

Note:
*Rippability criteria based on the use of a Caterpillar D-9 dozer ripping with a single shank; varies when trenching

6.5. Faulting and Seismicity

The project area is considered to be seismically active. Based on our review of the referenced geologic maps and stereoscopic aerial photographs, as well as on our geologic field mapping, the subject alignment is not underlain by known active or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years and 2,000,000 years, respectively) (see Figure 3). The Elsinore Fault has been mapped approximately 38 miles east of the site and the Rose Canyon Fault has been mapped approximately 8 miles west of the site.

In general, hazards associated with seismic activity include strong ground motion, ground surface rupture, lateral spread, liquefaction, seismically induced settlement, and tsunamis. Liquefaction, seismically induced settlement, lateral spread, and tsunamis are not considered design constraints on the project due to the site elevation and underlying materials. The remaining hazards are discussed in the following sections.

6.5.1. Strong Ground Motion

Based on attenuation ground motions developed by Campbell and Borzognia (1997), the project is located in a zone where the horizontal peak ground acceleration having a 10 percent probability of exceedance in 50 years is 0.17g (17 percent of the acceleration of gravity). The peak ground acceleration having a 10 percent probability of exceedance in 100 years is 0.24g (24 percent of the acceleration of gravity) (Blake, 2000). The requirements of the governing jurisdictions and applicable building codes should be considered in the project design.

6.5.2. Seismic Response Spectra

Seismic response spectra were constructed using the FRISKSP computer program (Blake, 2000) as well as the general empirical approach and amplification factors recommended by Newmark and Hall (1982). Median (50 percentile) structural amplification factors were used together with the peak ground motion parameters to evaluate spectral values of acceleration. The seismic response spectra for 0.5 and 2 percent damping are graphically presented on Figure 4. Figure 4 represents the response spectrum for a 10 percent probability of exceedance in 50 years.

6.5.3. Surface Rupture

Ground surface rupture due to faulting is considered unlikely in the project area, as there are no known underlying active faults. Lurching or cracking of the ground surface as a result of nearby or distant seismic events is also considered unlikely.

6.5.4. CBC Seismic Design Parameters

According to the 2001 California Building Code (CBC), the proposed project alignment is in Seismic Zone 4, but is not within a Near-Source Zone. Based on our subsurface explorations, Table 1 includes the seismic design parameters for the site as defined in the 2001 edition of the CBC (California Building Standards Commission, 2001).

Table 3 – Seismic Design Parameters

Parameter	Value	2001 CBC Reference
Seismic Zone Factor, Z	0.40	Table 16 – I
Soil Profile Type	S_A	Table 16 – J
Seismic Coefficient C_a	0.32	Table 16 – Q
Seismic Coefficient C_v	0.32	Table 16 – R
Near-Source Factor, N_a	1.0	Table 16 – S
Near-Source Factor, N_v	1.0	Table 16 – T
Seismic Source Type	B	Table 16 – U

6.6. Landsliding

No landslides or indications of deep-seated landsliding were noted at the proposed site during our field exploration or our review of available geologic literature, topographic maps, and stereoscopic aerial photographs.

7. CONCLUSIONS AND RECOMMENDATIONS

Based on our review of the referenced background data and subsurface evaluation, it is our opinion that the proposed project is feasible from a geotechnical standpoint, provided the conclusions and recommendations in this report are considered during the design and construction of the project. In our opinion, the following will be significant in the planning, design, and construction of the proposed project:

- The study area is underlain by very hard metavolcanic rock. Excavations may not be possible with standard heavy duty earthmoving equipment, and will necessitate the use of breakout equipment or blasting.
- In general, soil materials generated from the site excavations will not be suitable for reuse as backfill. Disposal or crushing of this material should be anticipated.
- Based on Caltrans criteria and our laboratory test results, the site would not be considered corrosive. Further recommendations regarding corrosivity are provided in Appendix E.
- Groundwater was not encountered in our exploratory borings. However, some seepage should be anticipated based on the topography and the jointed and fractured characteristics of the underlying rock.

Recommendations pertaining to the geotechnical aspects of the project are based on the results of the engineering analysis and our understanding of the project, and are presented in the following sections. Should the proposed project plans change, a supplemental geotechnical evaluation may be needed.

7.1. Earthwork

In general, earthwork should be performed in accordance with the recommendations presented in this report. The geotechnical consultant should be contacted for questions regarding the recommendations or guidelines presented herein. In addition, Typical Earthwork Guidelines for the project are included as Appendix D. In the event of a conflict in recommendations, the recommendations presented in the text of this report supersede those in Appendix D.

7.1.1. Site Preparation

The project improvement areas should be cleared and grubbed prior to grading. Clearing and grubbing should consist of the removal of vegetation, asphalt concrete and other deleterious materials. Clearing and grubbing should extend to the outside of the proposed excavation areas. The debris generated during clearing and grubbing should be removed from areas to be graded and disposed of off site at a legal dumpsite.

7.1.2. Temporary Excavations and Shoring

We recommend that trenches and excavations be designed and constructed in accordance with Occupational Safety and Health Administration (OSHA) regulations. These regulations provide trench sloping and shoring design parameters for trenches up to 20 feet deep based on a description of the soil types encountered. Trenches over 20 feet deep should be designed by the Contractor's engineer based on site-specific geotechnical analyses. For planning purposes, we recommend that the following OSHA soil classifications be used:

Santiago Peak Volcanics	*Type A*
Weathered Volcanics	*Type B*

Upon making the excavations, the soil classifications and excavation performance should be evaluated in the field by the geotechnical consultant in accordance with the OSHA regulations.

Temporary excavations should be constructed in accordance with OSHA recommendations. For trench or other excavations, OSHA requirements regarding personnel safety should be met by laying back the slopes no steeper than 3/4:1 (horizontal:vertical) for volcanic rock, and 1:1 for weathered volcanics. Temporary excavations that encounter seepage may be stabilized by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis. As an alternative to laying back the side walls, the excavations may be shored or braced. Temporary earth retaining systems will be subjected to lateral loads resulting from earth pressures.

The design of the earth pressure diagram assumes that spoils from the excavation or other surcharge loads will not be placed above the excavation within a 1:1 plane extending up and back from the excavation. If spoil piles are placed closer than this to the braced excavation, the resulting surcharge loads should be considered in the bracing design. We recommend that an experienced structural engineer design the shoring systems. The shoring parameters presented in this report should be considered as guidelines.

We recommend that excavated areas be backfilled as soon as practicable. The stability of the excavations decreases over time as the soil dries and weathers. On-site safety of personnel is the responsibility of the contractor.

7.1.3. Excavation Characteristics

Our evaluation of the excavation characteristics of the on-site materials is based on the results of our exploratory program, our site observations, and our experience with similar materials. Our borings at the site encountered fill, weathered volcanics and fresh volcanic rock. In our opinion, excavation to the anticipated depths for construction can not generally be performed with conventional earth moving equipment. The improve-

ment areas will encounter intensely weathered to fresh metavolcanic rock, which will necessitate the use of heavy ripping or hydraulic breakout equipment or blasting. Over-excavation in rock materials should be anticipated in order to achieve the planned grade. Note that in some areas, blasting may not be a viable alternative due to the potential for damage of nearby structures, such as adjacent to the subterranean concrete tanks at the sedimentation/flocculation basin. Where blasting is planned, we recommend vibration monitoring be performed at strategic points around the activities.

7.1.4. Slopes

Slopes may be needed to develop the site. Cut and fill slopes constructed in site materials at a gradient of 2:1 in accordance with the guidelines presented in Appendix D are considered to be stable. Steeper slopes constructed in Santiago Peak Volcanics may be possible if evaluated on a case-by-case basis, but will result in increased erosion and maintenance and may not support vegetation.

7.1.5. Preparation for Structures

Based on the excavation characteristics of the site materials, overexcavations are anticipated. Overexcavations made to provide grade for structures should be cleaned and backfilled with compacted clean sand. To reduce the potential for differential settlements, we recommend that the sand be densified by means of a vibratory plate or roller compactor. The compactor should make two passes (one pass equals down and back) on the surface of each lift. The lift thickness should not exceed one-half of the width of the plate on the compactor.

7.1.6. Import Soil

We recommend that import material consist of granular, very low to low expansive material (Uniform Building Code Expansion Index of 50 or less). The import material should have an organic content of less than 3 percent by volume (1 percent by weight), not contain rocks or lumps over 3 inches in largest dimension, and not more than 40 percent larger than 3/4 inch. The import material should also have low corrosion potential (elec-

trical resistivity greater than 1,000 ohm-cm, and soluble sulfate content of less than 0.2 percent). Import material should be evaluated by the geotechnical consultant at the borrow site for its suitability as fill prior to importation to the project site.

7.1.7. Trench Backfill

The soils encountered in the borings should be generally suitable for reuse as backfill of the trench zone provided they are free of organic material (less than 3 percent by volume or 1 percent by weight), contaminated material, clay lumps, debris, and rocks greater than 3 inches in diameter. Rocks greater than 3/4 inch in diameter should not exceed 40 percent of the backfill volume. Soils classified as silts or clays should not be used for backfill material in the pipe zone.

Backfill should be moisture conditioned to within approximately 2 percent of the optimum moisture content, placed, and compacted to 90 percent or greater relative compaction, as evaluated by ASTM D 1557. Wet soils, if encountered, should be moisture conditioned to within approximately 2 percent of optimum prior to their placement as backfill. Backfill lift thickness will be dependent upon the type of compaction equipment utilized. Backfill should generally be placed in uniform lifts not exceeding 8 inches in loose thickness. The upper 1 foot of pavement subgrade, base, and asphalt concrete should be compacted to 95 percent or more relative compaction. Special care should be exercised to avoid damaging the pipes during compaction of the backfill.

7.2. Thrust Blocks

Thrust blocks should be designed for the support of pipelines in accordance with the pressure diagram on Figure 5. Thrust block excavations should be backfilled with compacted granular material in accordance with the recommendations included in this report.

7.3. Pipe Bedding and Modulus of Soil Reaction (E')

It is our recommendation that the new pipeline, where constructed in open excavations, be supported on 4 or more inches of granular bedding material. Granular pipe bedding should

be provided to distribute vertical loads around the pipe. Bedding material and compaction requirements should be in accordance with this report, and the Standard Specifications for Public Works Construction (Public Works Standards, Inc., 2000), known as the "Greenbook." Section 306-1.2.1 in the Greenbook defines bedding requirements for the installation of pipe. The trench excavation should provide 6 to 8 inches of lateral clearance between the trench wall and the side of the pipe. Pipe bedding typically consists of graded aggregate. The pipe bedding and pipe zone backfill should conform to the following gradation limits:

Sieve Sizes	Percentage Passing Sieves
1"	100%
3/4"	90-100%
No. 4	50-95%
No. 30	25-45%
No. 200	3-9%

Pipe bedding and pipe zone backfill should have a Sand Equivalent (SE) of 30 or greater, and be placed around the sides and top of the pipe. In addition, the pipe zone backfill should extend 1 foot or more above the top of the pipe.

The modulus of soil reaction (E') is used to characterize the stiffness of soil backfill placed at the sides of buried flexible pipes for the purpose of evaluating deflection caused by the weight of the backfill over the pipe. A soil reaction modulus of 2,200 pounds per square inch (psi) may be used for a 0- to 5-foot deep excavation backfilled with granular soil compacted to 90 percent in accordance with American Society for Testing and Materials (ASTM) D 1557-02. A soil reaction modulus of 2,400 psi may be used for trenches 5 to 10 feet deep, and a modulus of 2,500 psi for trenches 10 to 15 feet deep. In lieu of pipe zone backfill, the use of controlled low strength materials (CLSM) as defined by Greenbook may be considered.

7.4. Foundations

Structural details of the future construction on the site are unknown at this time. However, we anticipate that the membrane facility building will be a one-story (approximately 15 feet tall), reinforced concrete structure at or near grade. Therefore, we are providing the follow-

ing preliminary foundation recommendations. Additional geotechnical recommendations may be needed once details of construction are known.

7.4.1. Shallow Foundations

Continuous and/or spread footings should be founded in moderately weathered to fresh volcanics or engineered fill. Footings founded as recommended may be designed using an allowable bearing capacity of 3,000 pounds per square foot (psf). The allowable bearing pressures may be increased by one-third when considering loading of short duration such as wind or seismic forces.

Foundations should have an embedment depth of 12 inches or more below the adjacent grade. Continuous footings should be 12 or more inches wide and spread foundations should be 18 or more inches square. Footings should be reinforced in accordance with the structural engineer's recommendations. From a geotechnical standpoint, we recommend that footings founded in very low or low expansive granular materials be reinforced with four No. 4 or larger reinforcing bars, two placed near the top and two near the bottom of the footings.

7.4.2. Shallow Foundation Lateral Resistance

For resistance of foundations to lateral loads, we recommend an allowable passive pressure exerted by an equivalent fluid weight of 300 pounds per cubic foot (pcf) be used with a value of up to 3,000 psf. This value assumes that the ground is horizontal for a distance of 10 feet or more, or three times the height generating the passive pressure, whichever is greater. We recommend that the upper 1 foot of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance.

For frictional resistance to lateral loads, we recommend a coefficient of friction of 0.45 be used between soil and concrete. The allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance provided the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance values

may be increased by one-third when considering loads of short duration such as wind or seismic forces.

7.4.3. Static Settlement

We estimate that the proposed structures, designed and constructed as recommended herein, will undergo total settlements of less than approximately 1 inch. Differential settlements are typically about one-half of the total settlement.

7.5. Slabs-on-Grade

We recommend that conventional, slab-on-grade floors, underlain by granular materials, be 4 or more inches in thickness and be reinforced with No. 3 or larger reinforcing bars spaced 18 inches on center each way. The reinforcing bars should be placed near the mid-point of the slab thickness. As a means to help reduce shrinkage cracks, we recommend that the slabs be provided with expansion joints at intervals of approximately 10 feet, each way or as recommended by the structural engineer. The slab reinforcement and expansion joint spacing should be designed by the structural engineer.

If moisture sensitive floor coverings are to be used, we recommend that slabs be underlain by a vapor retarder and capillary break system consisting of a 10-mil polyethylene (or equivalent) membrane placed over 4 inches of clean medium to coarse sand or pea gravel and overlain by an additional 2 inches of sand to help protect the membrane from puncture during placement and to aid in concrete curing. The exposed subgrade should be moistened just prior to the placement of concrete.

Exterior concrete flatwork placed on compacted subgrade should be 4 inches or more in thickness and should be reinforced with No. 3 reinforcing bars placed at 24 inches on-center both ways. The vapor retarder may be deleted for exterior flatwork.

7.6. Retaining Walls

We anticipate that rigid retaining walls with drains will be constructed at the site. For the design of a rigid retaining wall that is restrained against movement by rigid corners or structural connections, an at-rest pressure represented by an equivalent fluid weight of 65 pcf may be assumed. This pressure assumes low-expansive, level backfill and free-draining conditions. Where sloping backfill is anticipated, this earth pressure may be used provided that select granular materials evaluated by the geotechnical consultant are used as backfill materials. Loads due to traffic may be modeled as a 2 foot level surcharge of soil. This surcharge will act as a uniform horizontal pressure equal to 60 psf against the wall. Expansive soil should not be used for backfill. Drains should be provided behind the retaining walls as shown on Figure 6. Drains should be connected to an appropriate outlet.

7.7. Pavement

We anticipate the project may include pavement. Based on the results of our subsurface evaluation, laboratory tests, and our experience with soils similar to those encountered at and near the site, we have assumed an R-value of 50 for the preliminary design of flexible pavement at the project site. Actual pavement recommendations should be based on R-value tests performed on bulk samples of the soils that are exposed at the finished subgrade elevations across the site at the end of the mass grading operations.

We understand that traffic will consist primarily of automobiles, light trucks, and occasional heavy trucks. For design we have used Traffic Indices (TI) of 6.5, which is generally considered appropriate for refuge truck traffic on a daily basis. We recommend that the geotechnical consultant re-evaluate the pavement design, based on the R-value of the subgrade material exposed at the time of construction and actual anticipated traffic. The preliminary recommended pavement sections are listed on the following page:

Table 4 – Preliminary Recommended Pavement Sections

Area	Assumed R-Value	Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
Parking and Drives	50	6.5	3.5	4

We recommend that the upper 12 inches of the subgrade be compacted to a relative compaction of 95 percent. If traffic loads are different from those assumed, the pavement design should be re-evaluated.

We suggest that consideration be given to using portland cement concrete pavements in areas where dumpsters will be stored and where refuse trucks will stop and load. Experience indicates that refuse truck traffic can significantly shorten the useful life of asphalt concrete sections. We recommend that in these areas, 6 inches of 600 psi flexural strength portland cement concrete reinforced with No. 3 bars, 18-inches on center, be placed over a compacted, granular subgrade.

7.8. Soil Corrosivity

Laboratory testing was performed on samples of the on-site soils to evaluate pH and electrical resistivity, as well as chloride and sulfate contents. The pH and electrical resistivity tests were performed in accordance with California Test Method 643, and the sulfate and chloride tests were performed in accordance with California Test Methods 416 and 422, respectively. These laboratory test results are presented in Appendix B.

The results of the corrosivity testing indicated an electrical resistivity of the sample tested of approximately 10,050 ohm-cm. The soil pH of the samples was approximately 7.3, which is considered nearly neutral. The chloride content of the tested samples was approximately 70 parts per million (ppm). The sulfate content of the tested sample was approximately 0.01 percent. Based on our laboratory test results and California Department of Transportation (Caltrans) criteria, the alignment should not be classified as a corrosive site, which is defined as soil with more than 500 ppm chlorides, more than 0.20 percent sulfates, or pH less than 5.5.

Further testing and analysis of the corrosive site properties, including laboratory testing and resistivity field surveys, was performed as part of a parallel study by DEC Consultants. The results of this study are included for convenience in Appendix E.

7.9. Concrete

Concrete in contact with soil or water that contains high concentrations of soluble sulfates can be subject to chemical deterioration. Laboratory testing indicated the sulfate content of the samples tested was approximately 0.01 percent, which is considered a negligible potential for sulfate attack based on CBC criteria (California Building Standards Commission, 2001). Although our laboratory testing did not indicate a significant sulfate content, due to the potential for variable conditions at the site and import materials, we recommend that Type V cement be used for concrete structures in contact with soil. The concrete should have a water-cement ratio no greater than 0.45 by weight for normal-weight aggregate concrete, and a slump of 4 inches or less.

7.10. Pre-Construction Conference

We recommend that a pre-construction conference be held. Owner representatives, the civil engineer, geotechnical consultant, and contractor should be in attendance to discuss the plans, construction sequence, construction schedule, and special project considerations.

7.11. Construction Observation

The conclusions and recommendations presented in this report are based on analysis of observed conditions encountered in our exploratory borings. If conditions are found to vary from those described in this report, the geotechnical consultant should be notified and additional recommendations will be provided upon request. The project geotechnical consultant should review the project drawings and specifications prior to the commencement of construction. The geotechnical consultant should perform appropriate observation and testing services during construction operations.

8. LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purpose only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur

due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

9. SELECTED REFERENCES

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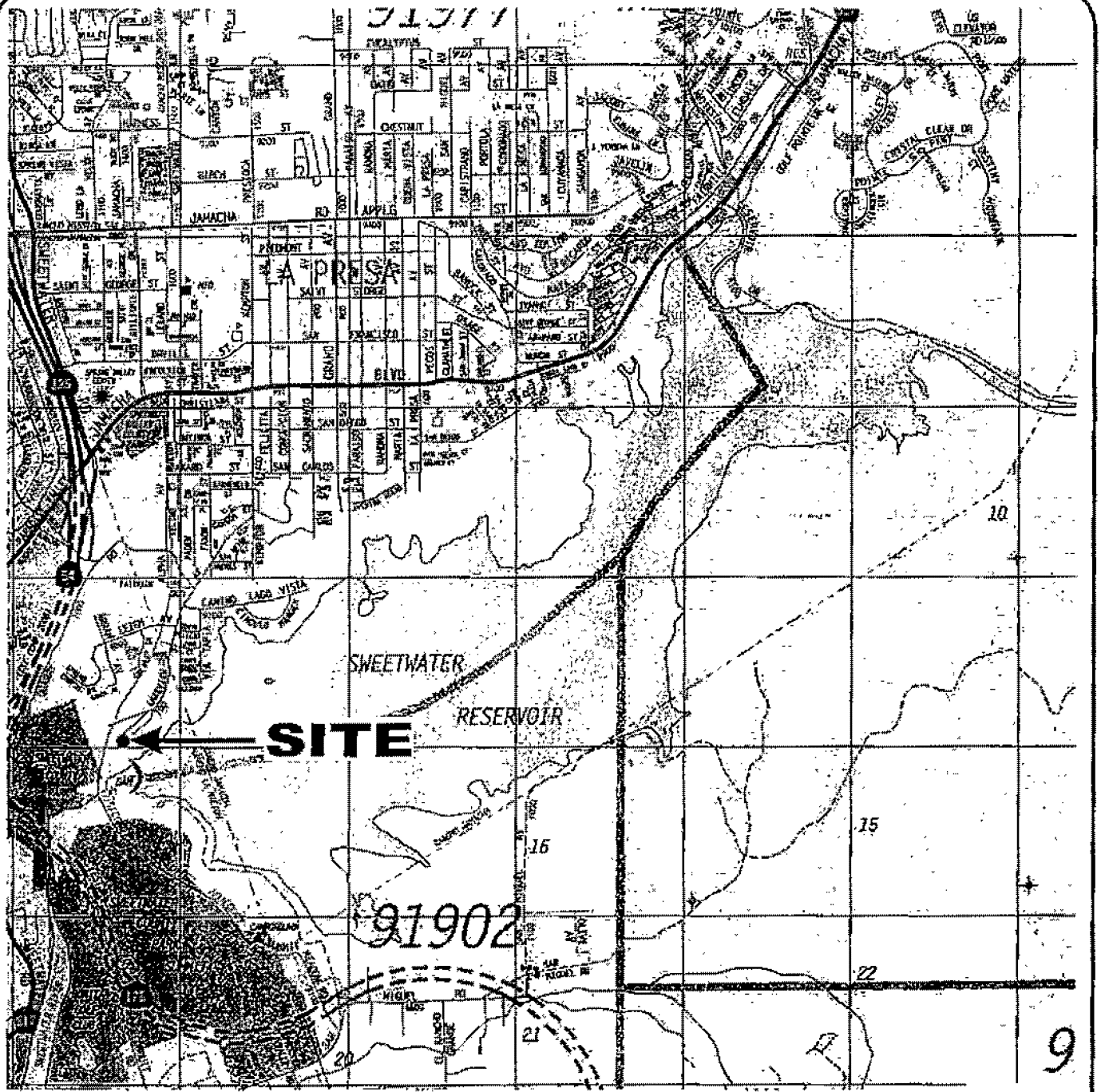
AERIAL PHOTOGRAPHS				
Source	**Date**	**Flight**	**Numbers**	**Scale**
USDA	4-14-53	AXN-9M	162 and 163	1:20,000



REFERENCE: 2004 THOMAS GUIDE FOR SAN DIEGO COUNTY, STREET GUIDE AND DIRECTORY

105602001 SLM Fig 1

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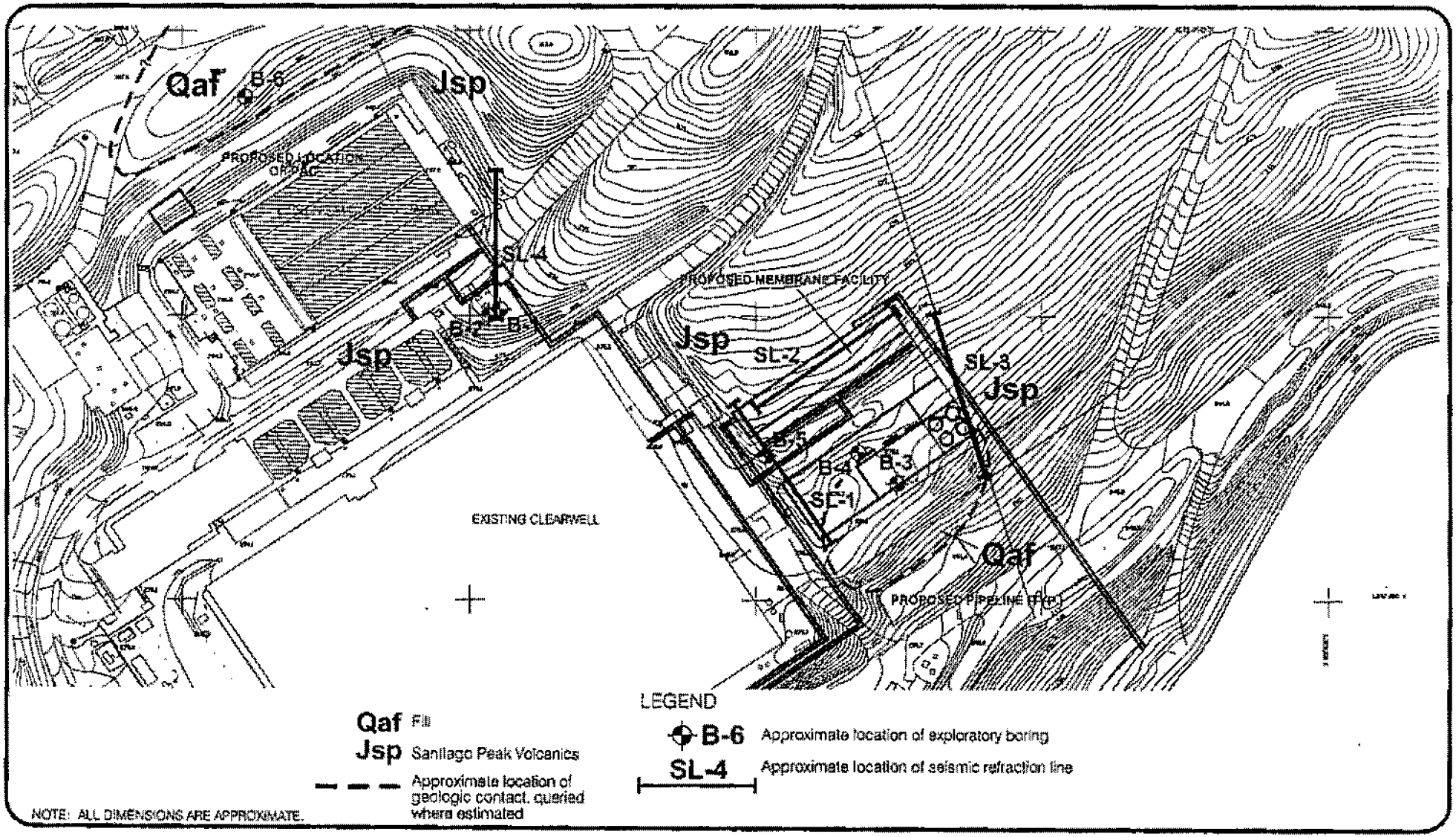
SITE LOCATION MAP

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	1

105602001 blm fig



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0 100 200

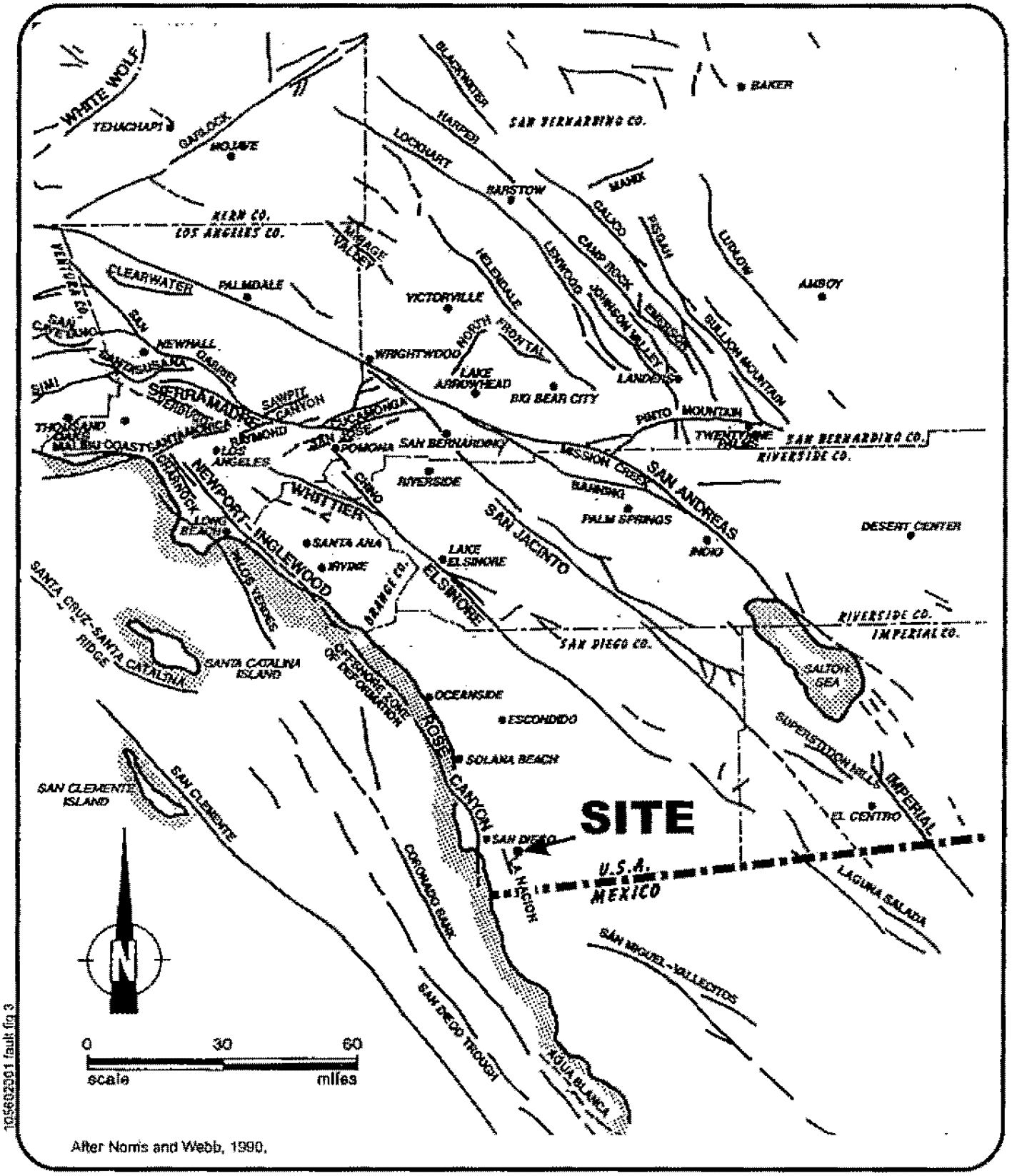
Approximate Scale in Feet

EXPLORATION LOCATION MAP

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE
105602001	11/05

FIGURE 2



After Norris and Webb, 1990.

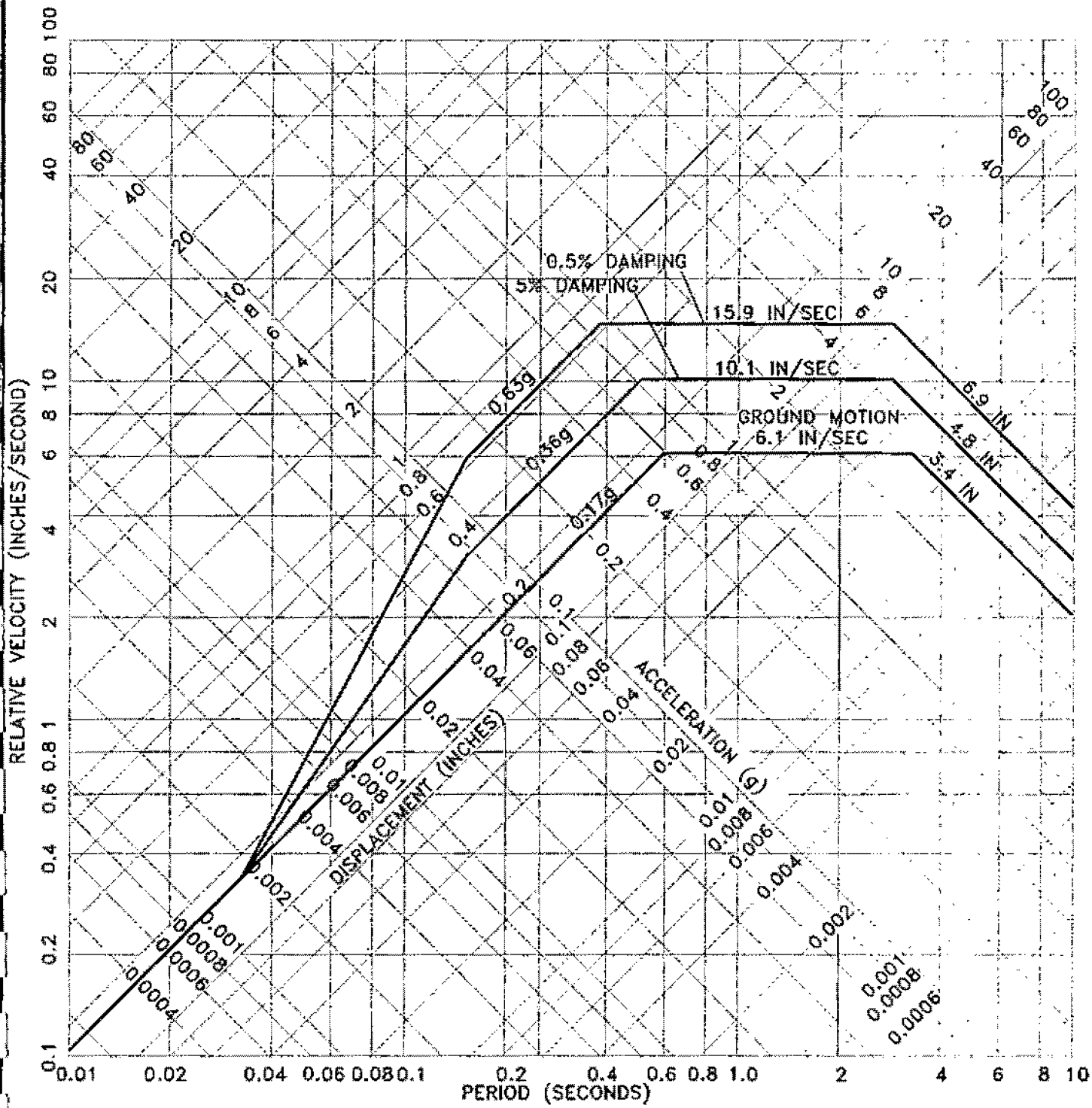
105602001 fault fig 3

Ninyo & Moore

FAULT LOCATION MAP

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	3



105801001 seismic fig 4

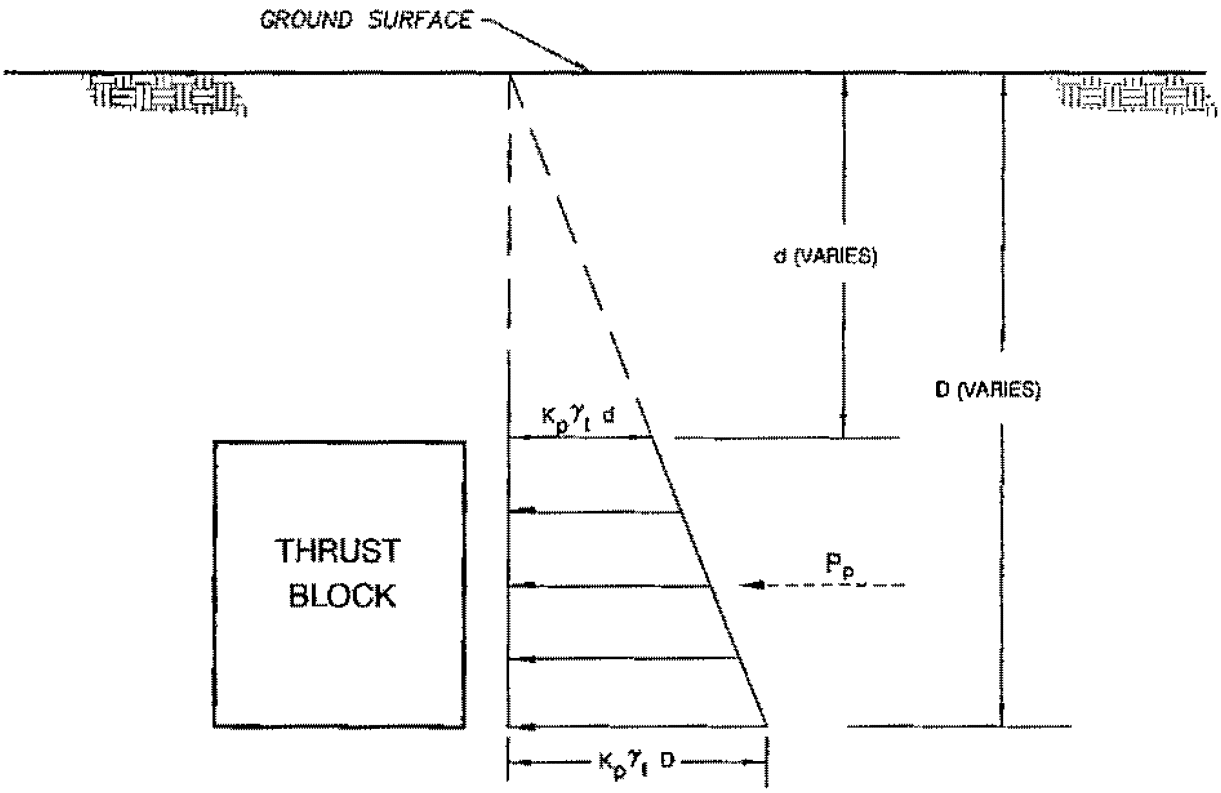
Ninyo & Moore

SEISMIC RESPONSE SPECTRA

0.17g PEAK GROUND ACCELERATION

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	4



NOTES:

1. $P_p = (1/2) K_p \gamma_t (D^2 - d^2) = 150 (D^2 - d^2)$ lb/ft
2. NO GROUNDWATER
3. d AND D ARE IN FEET
4. ASSUMES BACKFILL IS GRANULAR MATERIAL
5. ASSUMES THRUST BLOCK IS ADJACENT TO COMPETENT MATERIAL

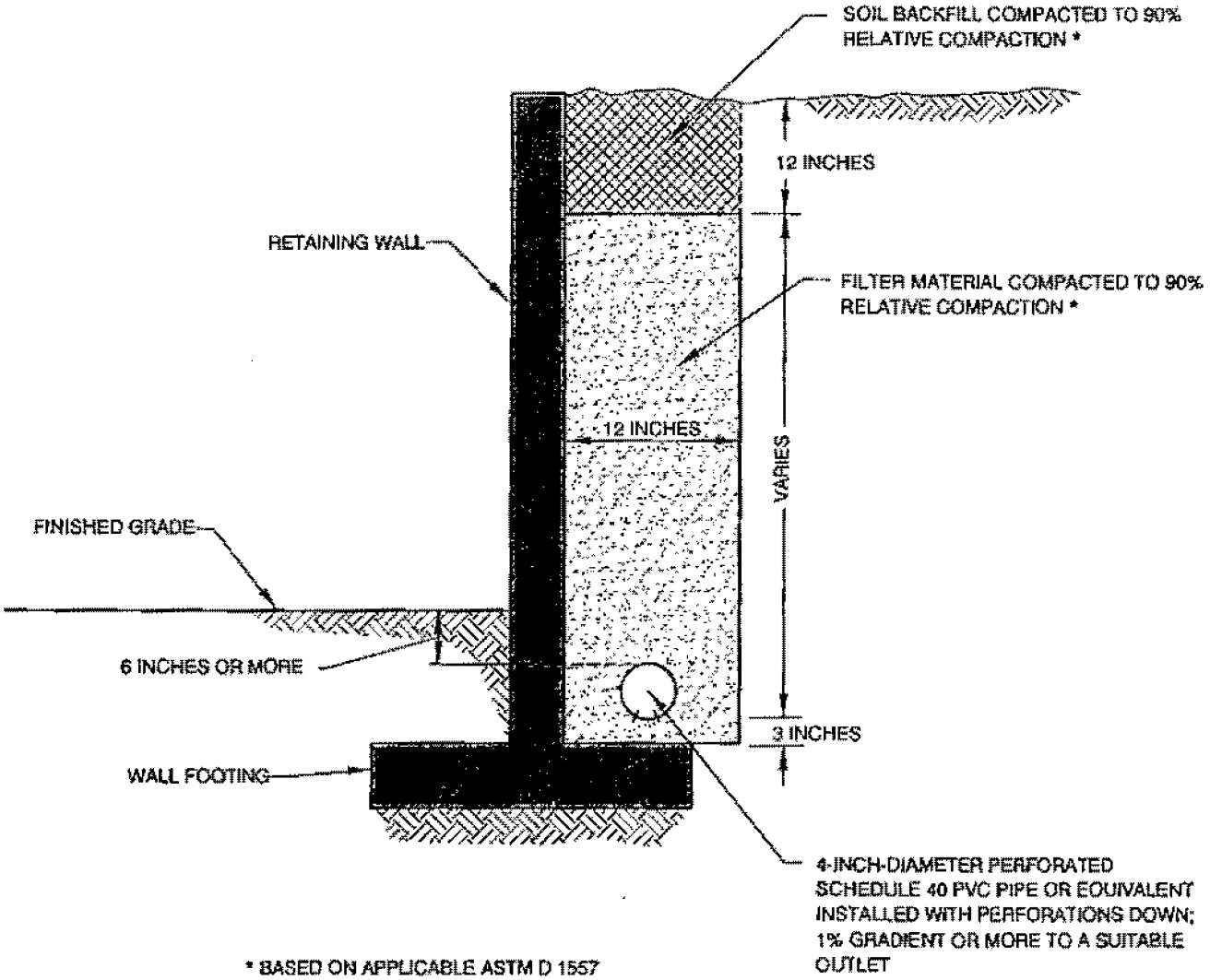
NOT TO SCALE

Ninyo & Moore

THRUST BLOCK LATERAL EARTH PRESSURE DIAGRAM

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	5



* BASED ON APPLICABLE ASTM D 1557

FILTER MATERIAL

FILTER MATERIAL SHALL BE CLASS II PERMEABLE MATERIAL PER STATE OF CALIFORNIA STANDARD SPECIFICATIONS.

SIEVE SIZE	PERCENT PASSING
1 INCH	100
3/4 INCH	90–100
3/8 INCH	40–100
No. 4	25–40
No. 8	18–33
No. 30	5–15
No. 50	0–7
No. 200	0–3

NOTE: AS AN ALTERNATIVE, THE FILTER MATERIAL MAY CONSIST OF 3/4-INCH OPEN-GRADED GRAVEL WRAPPED IN AN APPROVED GEOFABRIC.

NOT TO SCALE

Ninyo & Moore

RETAINING WALL DRAINAGE DETAIL

FIGURE 6

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples

Bulk samples of representative earth materials were obtained from the exploratory excavations. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Spoon

Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test spoon sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The spoon was driven into the ground 12 to 18 inches with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586-99. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the spoon, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples

Relatively undisturbed soil samples were obtained in the field using the following methods.

The Modified Split-Barrel Drive Sampler

The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer in general accordance with ASTM D 3550-01. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

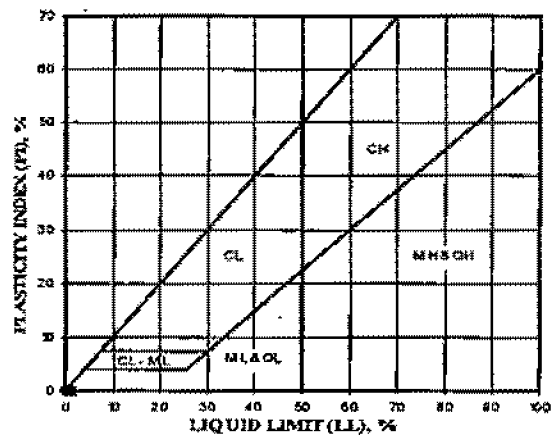
U.S.C.S. METHOD OF SOIL CLASSIFICATION

MAJOR DIVISIONS		SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 1/2 of soil >No. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction <No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (More than 1/2 of soil <No. 200 sieve size)	SILTS & CLAYS Liquid Limit <50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit >50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils

GRAIN SIZE CHART

CLASSIFICATION	RANGE OF GRAIN SIZE	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL Coarse Fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
SAND Coarse Medium Fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.76 to 0.075 4.76 to 2.00 2.00 to 0.420 0.420 to 0.075
SILT & CLAY	Below No. 200	Below 0.075

PLASTICITY CHART



Ninyo & Moore | U.S.C.S. METHOD OF SOIL CLASSIFICATION

BORING LOG EXPLANATION SHEET

DEPTH (feet)	SAMPLES: Bulk	SAMPLES: Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0								Bulk sample.
								Modified split-barrel drive sampler.
								No recovery with modified split-barrel drive sampler.
								Sample retained by others.
								Standard Penetration Test (SPT).
5								No recovery with a SPT.
			XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
								No recovery with Shelby tube sampler.
								Continuous Push Sample.
				♀				Seepage.
10				⧩				Groundwater encountered during drilling.
				▼				Groundwater measured after drilling.
							SM	ALLUVIUM: Solid line denotes unit change.
								Dashed line denotes material change.
								Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Sheared Bedding Surface
15								
								The total depth line is a solid line that is drawn at the bottom of the boring.
20								

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BORING LOG

EXPLANATION OF BORING LOG SYMBOLS

PROJECT NO.	DATE	FIGURE
	Rev. 01/03	

DATE DRILLED 05/20/05 BORING NO. B-1

GROUND ELEVATION _____ SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. Auto Trip Hammer DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY RI

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						GM	FILL: Gravel surfacing.
						SM	WEATHERED VOLCANICS: Yellowish brown, dry to damp, very dense, silty fine to coarse SAND.
5							
10		50/4"	7.5	112.0			Light brown; little coarse sand and up to 1/4" gravel.
15		90/9"					Refusal.
							Total Depth = 17 feet (Auger Refusal). Groundwater not encountered during drilling. Backfilled on 05/20/05.
20							

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BORING LOG

PERDUE WATER TREATMENT PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	A-1

DATE DRILLED 05/20/05 BORING NO. B-2

GROUND ELEVATION _____ SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. Auto Trip Hammer DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY RI

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						GM	FILL: Gravel surfacing.
						SM	WEATHERED VOLCANICS: Yellowish brown, dry to damp, very dense, silty fine to coarse SAND.
5							
10							Refusal. Total Depth = 14 feet (Auger Refusal). Groundwater not encountered during drilling. Backfilled on 05/20/05.
15							
20							

Ninyo & Moore

BORING LOG

PESDUE WATER TREATMENT PLANT UPGRADES
SPRING VALLLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	A-2

DATE DRILLED 05/20/05 BORING NO. B-3

GROUND ELEVATION _____ SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. Auto Trip Hammer DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							GM	FILL: Brown, damp, loose to dense, clayey, fine to coarse sand GRAVEL and angular cobbles up to 8" in diameter.
								Auger refusal on boulder. Total Depth = 4.5 feet (Auger Refusal). Groundwater not encountered during drilling. No samples taken. Backfilled on 05/20/05.
5								
10								
15								
20								

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BORING LOG

PERDUE WATER TREATMENT PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	A-3

DATE DRILLED 05/20/05 BORING NO. B-4

GROUND ELEVATION _____ SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. Auto Trip Hammer DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY RI

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							GM	FILL/WEATHER VOLCANICS: Brown, damp, loose to dense, clayey, silty fine to coarse sandy GRAVEL with angular cobbles.
								SANTIAGO PEAK VOLCANICS: Refusal.
5								Total Depth = 4 feet (Auger Refusal). Groundwater not encountered during drilling. Backfilled on 05/20/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

PERDUE WATER TREATMENT PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
10560200	11/05	A-4

DATE DRILLED 05/20/05 BORING NO. B-5

GROUND ELEVATION _____ SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. Auto Trip Hammer DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY RI

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						GM	WEATHERED VOLCANICS: Light brown, dry to moist, dense, clayey, silty fine to coarse sandy GRAVEL and angular cobbles up to 4" in diameter.
							SANTIAGO PEAK VOLCANICS: Refusal.
5							Total Depth = 4 feet (Auger Refusal). Groundwater not encountered during drilling. Backfilled on 05/20/05.
10							
15							
20							

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BORING LOG

PERDUE WATER TREATMENT PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	A-5

DATE DRILLED 05/20/05 BORING NO. B-6

GROUND ELEVATION _____ SHEET 1 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. Auto Trip Hammer DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY RJ

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						GM	FILL: Light reddish brown, damp, medium dense, clayey silty sandy GRAVEL; size from 3/4 to 3-inch cobbles.
5							
10						SM	Reddish brown, damp, medium dense, clayey silty fine to medium SAND; with trace gravel.
15	X	50/5"					
20							

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BORING LOG

PERDUE WATER TREATMENT PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	A-6

DATE DRILLED 05/20/05 BORING NO. B-6

GROUND ELEVATION _____ SHEET 2 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. Auto Trip Hammer DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY RI

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20	X	50/2"				GM	WEATHERED SANTIAGO PEAK VOLCANICS: Light brown, damp, dense, silty clayey sandy GRAVEL; size from 1/4 to 2-inch.
25							Refusal. Total Depth=28 feet (Auger refusal). Groundwater not encountered during drilling. Backfilled on 05/20/05 with 8 cubic feet of hydrated bentonite.
30							
35							
40							

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BORING LOG

PERDUE WATER TREATMENT PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	A-7

APPENDIX B

LABORATORY TESTING

Classification
Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488-00. Soil classifications are indicated on the logs of the exploratory excavations in Appendix A.

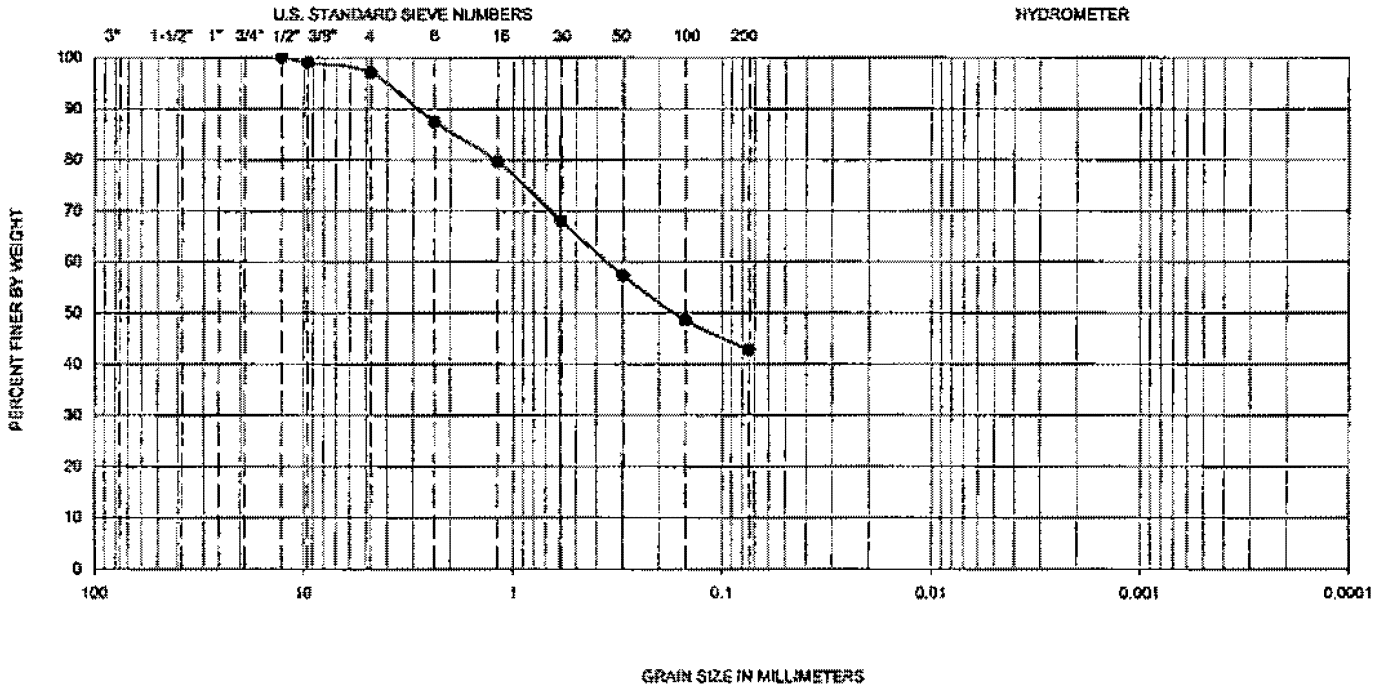
In-Place Moisture and Density Tests
The moisture content and dry density of relatively undisturbed samples obtained from the exploratory excavations were evaluated in general accordance with ASTM D 2937-00. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation Analysis
Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422-63. The grain size distribution curves are shown on Figures B-1 through B-2. The test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System.

Expansion Index Tests
The expansion index of a selected sample of site materials was evaluated in general accordance with U.B.C. Standard No. 18-2. A specimen was molded under a specified compactive energy at approximately 50 percent saturation (plus or minus 1 percent). The prepared 1-inch thick by 4-inch diameter specimen was loaded with a surcharge of 144 pounds per square foot and was inundated with tap water. Readings of volumetric swell were made for a period of 24 hours. The results of this test is presented on Figure B-3.

Soil Corrosivity Tests
Soil pH, and electrical resistivity tests were performed on a representative sample in general accordance with California Test (CT) 643. The chloride content of the selected sample was evaluated in general accordance with CT 422. The sulfate content of the selected sample was evaluated in general accordance with CT 417. The test results are presented on Figure B-4.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-2	10.0-14.0	--	--	--	--	--	--	--	--	43	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

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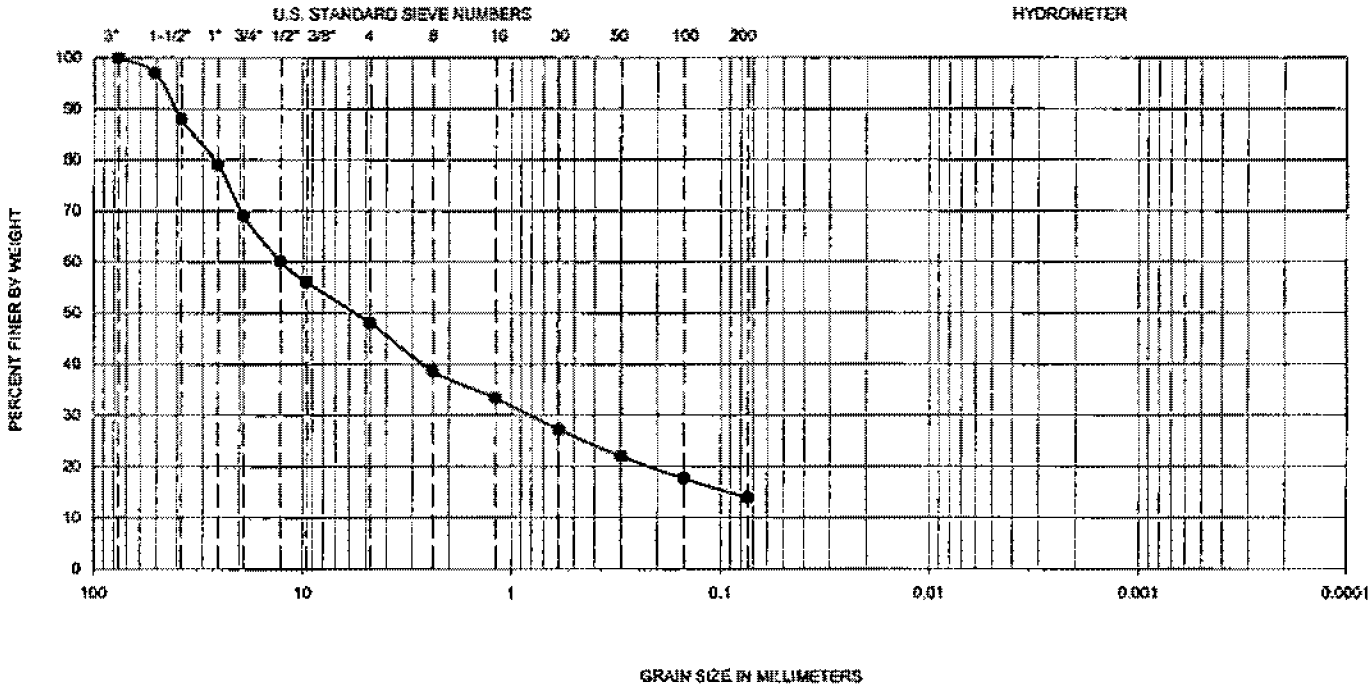
GRADATION TEST RESULTS

Perdue Water Treatment Plant Upgrades
Spring Valley, California

PROJECT NO.	DATE	FIGURE
105602001	11/05	B-1

105602001 Sieve, B-2 @ 10.0-14.0.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Hole No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-5	2.0-3.0	--	--	--	--	--	--	--	--	14	GM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

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GRADATION TEST RESULTS

Perdue Water Treatment Plant Upgrades
Spring Valley, California

PROJECT NO.	DATE	FIGURE
105602001	11/05	B-2

105602001 Sieve, B-5 @ 2.0-3.0.xls

EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (PCF)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (IN)	EXPANSION INDEX	EXPANSION POTENTIAL
B-5	2.0-3.0	9.0	113.6	18.1	0.024	24	Low

PERFORMED IN GENERAL ACCORDANCE WITH UBC STANDARD 18-2
PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4829-03

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EXPANSION INDEX TEST RESULTS

Perdue Water Treatment Plant Upgrades
Spring Valley, California

PROJECT NO.	DATE	FIGURE
105602001	11/05	B-3

CORROSIVITY TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH *	RESISTIVITY * (ohm-cm)	WATER-SOLUBLE SULFATE CONTENT IN SOIL ** (%)	CHLORIDE CONTENT *** (ppm)
B-5	2.0-3.0	7.3	10,050	0.01	70

* PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
** PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
*** PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

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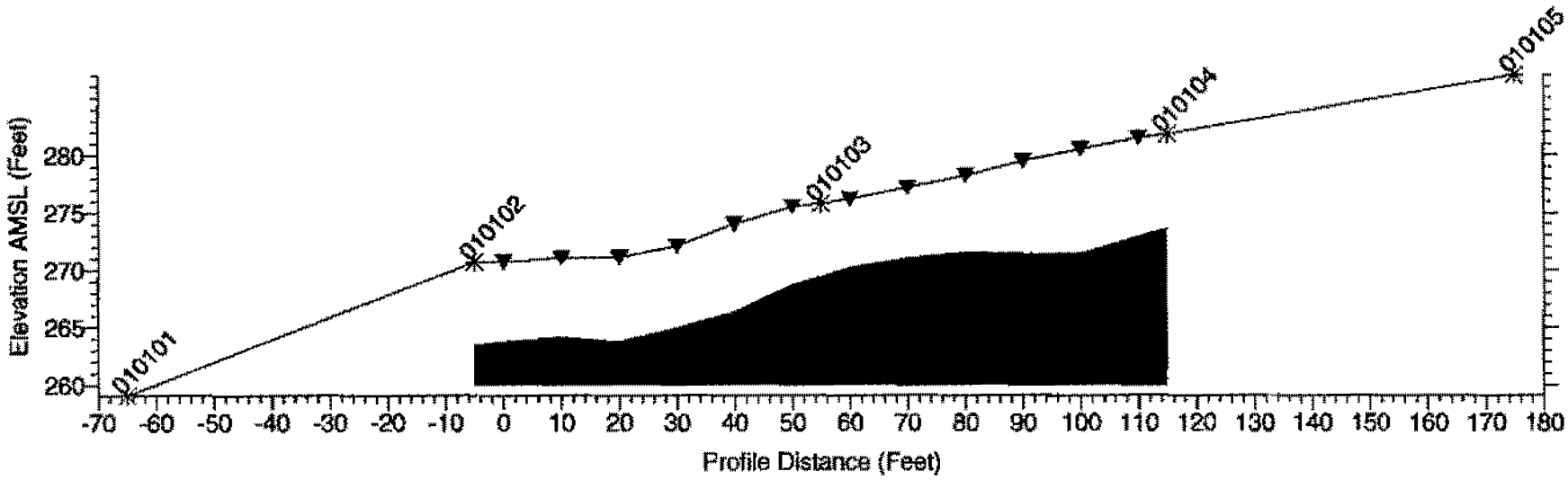
CORROSIVITY TEST RESULTS

Perdue Water Treatment Plant Upgrades
Spring Valley, California

PROJECT NO.	DATE	FIGURE
105602001	11/05	B-4

APPENDIX C

SEISMIC REFRACTION VELOCITY PROFILES



Notes :
Data collected with a Geometrics Smartseis Seismograph and Mark Products 8 Hz Geophones.

Data processed using SIP by Rimrock Geophysics.

Vertical exaggeration is two times.

LEGEND

- Shotpoint
- Geophone
- Layer 1 - Average Velocity 1940 ft/sec
- Layer 2 - Average Velocity 9950 ft/sec

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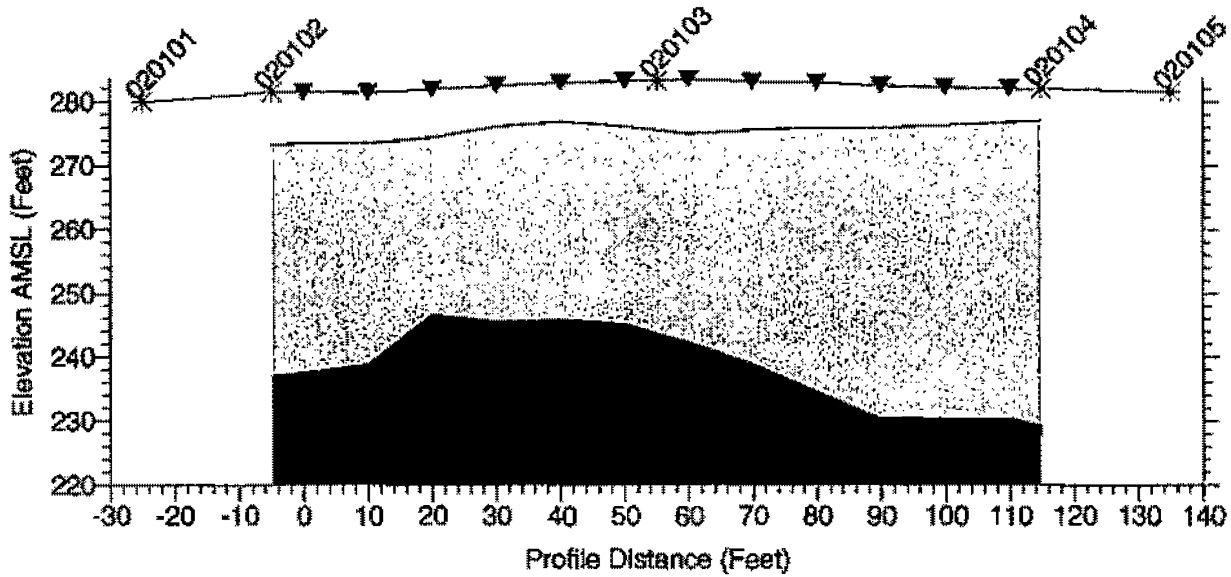
SEISMIC REFRACTION VELOCITY PROFILE SL-1

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	C-1



LEGEND

- Shotpoint
- Geophone
- Layer 1 - Average Velocity 1940 ft/sec
- Layer 2 - Average Velocity 5570 ft/sec
- Layer 3 - Average Velocity 16800 ft/sec

Notes :
Data collected with a Geometrics Smartseis Seismograph and Mark Products 8 Hz Geophones.

Data processed using SIP by Rimrock Geophysics.

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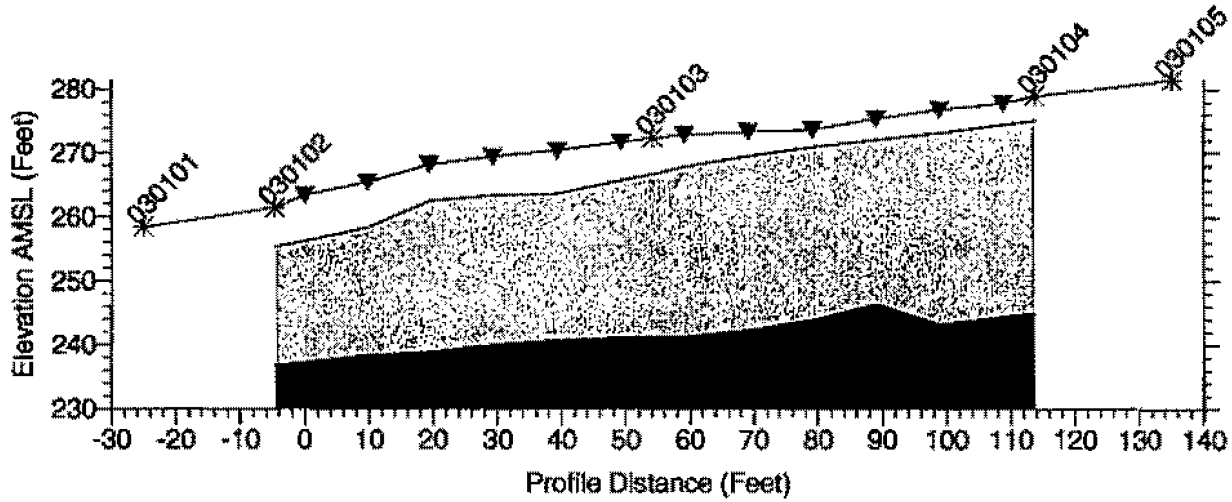
SEISMIC REFRACTION VELOCITY PROFILE SL-2

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	C-2



Notes :
Data collected with a Geometrics Smartseis Seismograph and Mark Products 8 Hz Geophones.

Data processed using SIP by Rimrock Geophysics.

LEGEND

- Shotpoint
- Geophone
- Layer 1 - Average Velocity 1940 ft/sec
- Layer 2 - Average Velocity 5570 ft/sec
- Layer 3 - Average Velocity 16800 ft/sec

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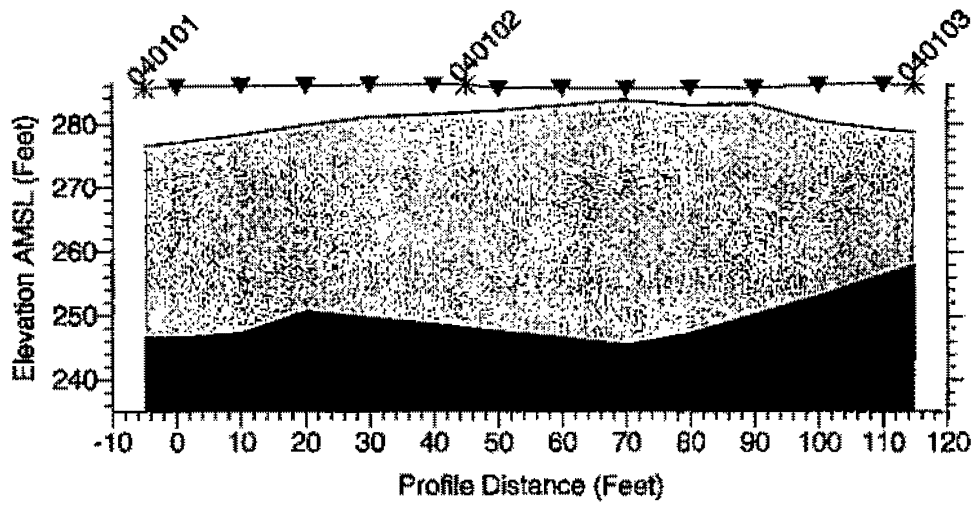
SEISMIC REFRACTION VELOCITY PROFILE SL-3

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	C-3



LEGEND

- Shotpoint
- Geophone
- Layer 1 - Average Velocity 1940 ft/sec
- Layer 2 - Average Velocity 5570 ft/sec
- Layer 3 - Average Velocity 16800 ft/sec

Notes :
Data collected with a Geometrics Smartseis Seismograph and Mark Products 8 Hz Geophones.

Data processed using SIP by Rimrock Geophysics.

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SEISMIC REFRACTION VELOCITY PROFILE SL-4

PERDUE PLANT UPGRADES
SPRING VALLEY, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105602001	11/05	C-4

APPENDIX D

TYPICAL EARTHWORK GUIDELINES

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4. REMOVALS AND EXCAVATIONS 4
5. COMPACTED FILL 5
6. OVERSIZED MATERIAL 7
7. SLOPES 8
8. TRENCH BACKFILL 11
9. DRAINAGE 13
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Figures

Figure A – Fill Slope Over Natural Ground or Cut
Figure B – Transition and Undercut Lot Details
Figure C – Canyon Subdrain Detail
Figure D – Oversized Rock Placement Detail
Figure E – Slope Drainage Detail
Figure F – Shear Key Detail
Figure G – Drain Detail

TYPICAL EARTHWORK GUIDELINES

1. GENERAL

These guidelines and the standard details attached hereto are presented as general procedures for earthwork construction. They are to be utilized in conjunction with the project grading plans. These guidelines are considered a part of the geotechnical report, but are superseded by recommendations in the geotechnical report in the case of conflict. Evaluations performed by the consultant during the course of grading may result in new recommendations which could supersede these specifications and/or the recommendations of the geotechnical report. It is the responsibility of the contractor to read and understand these guidelines as well as the geotechnical report and project grading plans.

1.1. The contractor shall not vary from these guidelines without prior recommendations by the geotechnical consultant and the approval of the client or the client's authorized representative. Recommendations by the geotechnical consultant and/or client shall not be considered to preclude requirements for approval by the jurisdictional agency prior to the execution of any changes.

1.2. The contractor shall perform the grading operations in accordance with these specifications, and shall be responsible for the quality of the finished product notwithstanding the fact that grading work will be observed and tested by the geotechnical consultant.

1.3. It is the responsibility of the grading contractor to notify the geotechnical consultant and the jurisdictional agencies, as needed, prior to the start of work at the site and at any time that grading resumes after interruption. Each step of the grading operations shall be observed and documented by the geotechnical consultant and, where necessary, reviewed by the appropriate jurisdictional agency prior to proceeding with subsequent work.

1.4. If, during the grading operations, geotechnical conditions are encountered which were not anticipated or described in the geotechnical report, the geotechnical consultant shall be notified immediately and additional recommendations, if applicable, may be provided.

1.5. An as-graded report shall be prepared by the geotechnical consultant and signed by a registered engineer and registered engineering geologist. The report documents the geotechnical consultants' observations, and field and laboratory test results, and

provides conclusions regarding whether or not earthwork construction was performed in accordance with the geotechnical recommendations and the grading plans. Recommendations for foundation design, pavement design, subgrade treatment, etc., may also be included in the as-graded report.

1.6. For the purpose of evaluating quantities of materials excavated during grading and/or locating the limits of excavations, a licensed land surveyor or civil engineer shall be retained.

1.7. Definitions of terms utilized in the remainder of these specifications have been provided in Section 11.

2. OBLIGATIONS OF PARTIES

The parties involved in the projects earthwork activities shall be responsible as outlined in the following sections.

2.1. The client is ultimately responsible for the aspects of the project. The client or the client's authorized representative has a responsibility to review the findings and recommendations of the geotechnical consultant. The client shall authorize the contractor and/or other consultants to perform work and/or provide services. During grading the client or the client's authorized representative shall remain on site or remain reasonably accessible to the concerned parties to make the decisions that may be needed to maintain the flow of the project.

2.2. The contractor is responsible for the safety of the project and satisfactory completion of grading and other associated operations, including, but not limited to, earthwork in accordance with the project plans, specifications, and jurisdictional agency requirements. During grading, the contractor or the contractor's authorized representative shall remain on site. The contractor shall further remain accessible during non-working hours times, including at night and during days off.

2.3. The geotechnical consultant shall provide observation and testing services and shall make evaluations to advise the client on geotechnical matters. The geotechnical consultant shall report findings and recommendations to the client or the client's authorized representative.

2.4. Prior to proceeding with any grading operations, the geotechnical consultant shall be notified two working days in advance to schedule the needed observation and testing services.

2.4.1. Prior to any significant expansion or reduction in the grading operation, the geotechnical consultant shall be provided with two working days notice to make appropriate adjustments in scheduling of on-site personnel.

2.4.2. Between phases of grading operations, the geotechnical consultant shall be provided with two working days notice in advance of commencement of additional grading operations.

3. SITE PREPARATION

Site preparation shall be performed in accordance with the recommendations presented in the following sections.

3.1. The client, prior to any site preparation or grading, shall arrange and attend a pre-grading meeting between the grading contractor, the design engineer, the geotechnical consultant, and representatives of appropriate governing authorities, as well as any other involved parties. The parties shall be given two working days notice.

3.2. Clearing and grubbing shall consist of the substantial removal of vegetation, brush, grass, wood, stumps, trees, tree roots greater than 1/2-inch in diameter, and other deleterious materials from the areas to be graded. Clearing and grubbing shall extend to the outside of the proposed excavation and fill areas.

3.3. Demolition in the areas to be graded shall include removal of building structures, foundations, reservoirs, utilities (including underground pipelines, septic tanks, leach fields, seepage pits, cisterns, etc.), and other manmade surface and subsurface improvements, and the backfilling of mining shafts, tunnels and surface depressions. Demolition of utilities shall include capping or rerouting of pipelines at the project perimeter, and abandonment of wells in accordance with the requirements of the governing authorities and the recommendations of the geotechnical consultant at the time of demolition.

3.4. The debris generated during clearing, grubbing and/or demolition operations shall be removed from areas to be graded and disposed of off site at a legal dump site. Clearing, grubbing, and demolition operations shall be performed under the observation of the geotechnical consultant.

3.5. The ground surface beneath proposed fill areas shall be stripped of loose or unsuitable soil. These soils may be used as compacted fill provided they are generally free of organic or other deleterious materials and evaluated for use by the geotechnical consultant. The resulting surface shall be evaluated by the geotechnical consultant prior to proceeding. The cleared, natural ground surface shall be scari-

fied to a depth of approximately 8 inches, moisture conditioned, and compacted in accordance with the specifications presented in Section 5. of these guidelines.

3.6. Where fills are to be constructed on hillsides or slopes, topsoil, slope wash, colluvium, and other materials deemed unsuitable shall be removed. Where the exposed slope is steeper than 5 horizontal units to 1 vertical unit, or where recommended by the geotechnical consultant, the slope of the original ground on which the fill is to be placed shall be benched and a key as shown on Figure A of this document shall be provided by the contractor in accordance with the specifications presented in Section 7. of this document. The benches shall extend into the underlying bedrock or, where bedrock is not present, into suitable compacted fill as evaluated by the geotechnical consultant.

4. REMOVALS AND EXCAVATIONS

Removals and excavations shall be performed as recommended in the following sections.

4.1. Removals

4.1.1. Materials which are considered unsuitable shall be excavated under the observation of the geotechnical consultant in accordance with the recommendations contained herein. Unsuitable materials include, but may not be limited to, dry, loose, soft, wet, organic, compressible natural soils, fractured, weathered, soft bedrock, and undocumented or otherwise deleterious fill materials.

4.1.2. Materials deemed by the geotechnical consultant to be unsatisfactory due to moisture conditions shall be excavated in accordance with the recommendations of the geotechnical consultant, watered or dried as needed, and mixed to a generally uniform moisture content in accordance with the specifications presented in Section 5. of this document.

4.2. Excavations

4.2.1. Temporary excavations no deeper than 5 feet in firm fill or natural materials may be made with vertical side slopes. To satisfy CAL OSHA requirements, any excavation deeper than 5 feet shall be shored or laid back at a 1:1 (horizontal:vertical) inclination or flatter, depending on material type, if construction workers are to enter the excavation.

5. COMPACTED FILL

Fill shall be constructed as specified below or by other methods recommended by the geotechnical consultant. Unless otherwise specified, fill soils shall be compacted to 90 percent or greater relative compaction, as evaluated in accordance with ASTM Test Method D 1557-02.

5.1. Prior to placement of compacted fill, the contractor shall request an evaluation of the exposed ground surface by the geotechnical consultant. Unless otherwise recommended, the exposed ground surface shall then be scarified to a depth of approximately 8 inches and watered or dried, as needed, to achieve a generally uniform moisture content at or near the optimum moisture content. The scarified materials shall then be compacted to 90 percent or greater relative compaction. The evaluation of compaction by the geotechnical consultant shall not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify the geotechnical consultant and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review.

5.2. Excavated on-site materials which are in general compliance with the recommendations of the geotechnical consultant may be utilized as compacted fill provided they are generally free of organic or other deleterious materials and do not contain rock fragments greater than 6 inches in dimension. During grading, the contractor may encounter soil types other than those analyzed during the preliminary geotechnical study. The geotechnical consultant shall be consulted to evaluate the suitability of any such soils for use as compacted fill.

5.3. Where imported materials are to be used on site, the geotechnical consultant shall be notified three working days in advance of importation in order that it may sample and test the materials from the proposed borrow sites. No imported materials shall be delivered for use on site without prior sampling, testing, and evaluation by the geotechnical consultant.

5.4. Soils imported for on-site use shall preferably have very low to low expansion potential (based on UBC Standard 18-2 test procedures). Lots on which expansive soils may be exposed at grade shall be undercut 3 feet or more and capped with very low to low expansion potential fill. Details of the undercutting are provided in the Transition and Undercut Lot Details, Figure B of these guidelines. In the event expansive soils are present near the ground surface, special design and construction considerations shall be utilized in general accordance with the recommendations of the geotechnical consultant.

5.5. Fill materials shall be moisture conditioned to near optimum moisture content prior to placement. The optimum moisture content will vary with material type and other

factors. Moisture conditioning of fill soils shall be generally uniform in the soil mass.

5.6. Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill shall be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction.

5.7. Compacted fill shall be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift shall be watered or dried as needed to achieve near optimum moisture condition, mixed, and then compacted by mechanical methods, using sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other appropriate compacting rollers, to the specified relative compaction. Successive lifts shall be treated in a like manner until the desired finished grades are achieved.

5.8. Fill shall be tested in the field by the geotechnical consultant for evaluation of general compliance with the recommended relative compaction and moisture conditions. Field density testing shall conform to ASTM D 1556-00 (Sand Cone method), D 2937-00 (Drive-Cylinder method), and/or D 2922-96 and D 3017-96 (Nuclear Gauge method). Generally, one test shall be provided for approximately every 2 vertical feet of fill placed, or for approximately every 1000 cubic yards of fill placed. In addition, on slope faces one or more tests shall be taken for approximately every 10,000 square feet of slope face and/or approximately every 10 vertical feet of slope height. Actual test intervals may vary as field conditions dictate. Fill found to be out of conformance with the grading recommendations shall be removed, moisture conditioned, and compacted or otherwise handled to accomplish general compliance with the grading recommendations.

5.9. The contractor shall assist the geotechnical consultant by excavating suitable test pits for removal evaluation and/or for testing of compacted fill.

5.10. At the request of the geotechnical consultant, the contractor shall "shut down" or restrict grading equipment from operating in the area being tested to provide adequate testing time and safety for the field technician.

5.11. The geotechnical consultant shall maintain a map with the approximate locations of field density tests. Unless the client provides for surveying of the test locations, the locations shown by the geotechnical consultant will be estimated. The geotechnical consultant shall not be held responsible for the accuracy of the horizontal or vertical location or elevations.

5.12. Grading operations shall be performed under the observation of the geotechnical consultant. Testing and evaluation by the geotechnical consultant does not preclude the need for approval by or other requirements of the jurisdictional agencies.

5.13. Fill materials shall not be placed, spread or compacted during unfavorable weather conditions. When work is interrupted by heavy rains, the filling operation shall not be resumed until tests indicate that moisture content and density of the fill meet the project specifications. Regrading of the near-surface soil may be needed to achieve the specified moisture content and density.

5.14. Upon completion of grading and termination of observation by the geotechnical consultant, no further filling or excavating, including that planned for footings, foundations, retaining walls or other features, shall be performed without the involvement of the geotechnical consultant.

5.15. Fill placed in areas not previously viewed and evaluated by the geotechnical consultant may have to be removed and recompacted at the contractor's expense. The depth and extent of removal of the unobserved and undocumented fill will be decided based upon review of the field conditions by the geotechnical consultant.

5.16. Off-site fill shall be treated in the same manner as recommended in these specifications for on-site fills. Off-site fill subdrains temporarily terminated (up gradient) shall be surveyed for future locating and connection.

5.17. Prior to placement of a canyon fill, a subdrain shall be installed in bedrock or compacted fill along the approximate alignment of the canyon bottom if recommended by the geotechnical consultant. Details of subdrain placement and configuration have been provided in the Canyon Subdrain Detail, Figure C, of these guidelines.

5.18. Transition (cut/fill) lots shall generally be undercut 3 feet or more below finished grade to provide a generally uniform thickness of fill soil in the pad area. Where the depth of fill on a transition lot greatly exceeds 3 feet, overexcavation may be increased at the discretion of the geotechnical consultant. Details of the undercut for transition lots are provided in the Transition and Undercut Lot Detail, Figure B, of these guidelines.

6. OVERSIZED MATERIAL

Oversized material shall be placed in accordance with the following recommendations.

6.1. During the course of grading operations, rocks or similar irreducible materials greater than 6 inches in dimension (oversized material) may be generated. These materials shall not be placed within the compacted fill unless placed in general accordance with the recommendations of the geotechnical consultant.

6.2. Where oversized rock (greater than 6 inches in dimension) or similar irreducible material is generated during grading, it is recommended, where practical, to waste such material off site, or on site in areas designated as "nonstructural rock disposal

areas." Rock designated for disposal areas shall be placed with sufficient sandy soil to generally fill voids. The disposal area shall be capped with a 5-foot thickness of fill which is generally free of oversized material.

6.3. Rocks 6 inches in dimension and smaller may be utilized within the compacted fill, provided they are placed in such a manner that nesting of rock is not permitted. Fill shall be placed and compacted over and around the rock. The amount of rock greater than 3/4-inch in dimension shall generally not exceed 40 percent of the total dry weight of the fill mass, unless the fill is specially designed and constructed as a "rock fill."

6.4. Rocks or similar irreducible materials greater than 6 inches but less than 4 feet in dimension generated during grading may be placed in windrows and capped with finer materials in accordance with the recommendations of the geotechnical consultant, the approval of the governing agencies, and the Oversized Rock Placement Detail, Figure D, of these guidelines. Selected native or imported granular soil (Sand Equivalent of 30 or higher) shall be placed and flooded over and around the windrowed rock such that voids are filled. Windrows of oversized materials shall be staggered so that successive windrows of oversized materials are not in the same vertical plane. Rocks greater than 4 feet in dimension shall be broken down to 4 feet or smaller before placement, or they shall be disposed of off site.

7. SLOPES

The following sections provide recommendations for cut and fill slopes.

7.1. Cut Slopes

7.1.1. Unless otherwise recommended by the geotechnical consultant and accepted by the building official, permanent cut slopes shall not be steeper than 2:1 (horizontal:vertical). The recommended height of a cut slope shall be evaluated by the geotechnical consultant. Slopes in excess of 30 feet high shall be provided with terrace drains (swales) in accordance with the recommendations presented in the Uniform Building Code, Seetion 3315 and the details provided in Figure E of these guidelines.

7.1.2. The geotechnical consultant shall observe cut slopes during excavation. The geotechnical consultant shall be notified by the contractor prior to beginning slope excavations.

7.1.3. If excavations for cut slopes expose loose, cohesionless, significantly fractured, or otherwise unsuitable materials, overexcavation of the unsuitable material and replacement with a compacted stabilization fill shall be evaluated and may be recommended by the geotechnical consultant. Unless

otherwise specified by the geotechnical consultant, stabilization fill construction shall be in general accordance with the details provided on Figure F of these guidelines.

7.1.4. If, during the course of grading, adverse or potentially adverse geotechnical conditions are encountered in the slope which were not anticipated in the preliminary evaluation report, the geotechnical consultant shall evaluate the conditions and provide appropriate recommendations.

7.2. Fill Slopes

7.2.1. When placing fill on slopes steeper than 5:1 (horizontal:vertical), topsoil, slope wash, colluvium, and other materials deemed unsuitable shall be removed. Near-horizontal keys and near-vertical benches shall be excavated into sound bedrock or firm fill material, in accordance with the recommendation of the geotechnical consultant. Keying and benching shall be accomplished in general accordance with the details provided on Figure A of these guidelines. Compacted fill shall not be placed in an area subsequent to keying and benching until the area has been observed by the geotechnical consultant. Where the natural gradient of a slope is less than 5:1, benching is generally not recommended. However, fill shall not be placed on compressible or otherwise unsuitable materials left on the slope face.

7.2.2. Within a single fill area where grading procedures dictate two or more separate fills, temporary slopes (false slopes) may be created. When placing fill adjacent to a temporary slope, benching shall be conducted in the manner described in Section 7.2.1. A 3-foot or higher near-vertical bench shall be excavated into the documented fill prior to placement of additional fill.

7.2.3. Unless otherwise recommended by the geotechnical consultant and by the building official, permanent fill slopes shall not be steeper than 2:1 (horizontal:vertical). The height of a fill slope shall be evaluated by the geotechnical consultant. Slopes in excess of 30 feet high shall be provided with terrace drains (swales) and backdrains in accordance with the recommendations presented in the Uniform Building Code, Section 3315 and the details provided in Figure E of these guidelines.

7.2.4. Unless specifically recommended otherwise, compacted fill slopes shall be overbuilt and cut back to grade, exposing firm compacted fill. The actual amount of overbuilding may vary as field conditions dictate. If the desired results are not achieved, the existing slopes shall be overexcavated and reconstructed in accordance with the recommendations of the geotechnical consultant. The degree of overbuilding may be increased until the desired compacted slope face condition is achieved. Care shall be taken by the con-

tractor to provide mechanical compaction as close to the outer edge of the overbuilt slope surface as practical.

7.2.5. If access restrictions, property line location, or other constraints limit overbuilding and cutting back of the slope face, an alternative method for compaction of the slope face may be attempted by conventional construction procedures including backrolling at intervals of 4 feet or less in vertical slope height, or as dictated by the capability of the available equipment, whichever is less. Fill slopes shall be backrolled utilizing a conventional sheeps foot-type roller. Care shall be taken to maintain the specified moisture conditions and/or reestablish the same, as needed, prior to backrolling. .

7.2.6. The placement, moisture conditioning and compaction of fill slope materials shall be done in accordance with the recommendations presented in Section 5. of these guidelines.

7.2.7. The contractor shall be ultimately responsible for placing and compacting the soil out to the slope face to obtain a relative compaction of 90 percent or greater as evaluated by ASTM D 1557-02 and a moisture content in accordance with Section 5. The geotechnical consultant shall perform field moisture and density tests at intervals of one test for approximately every 10,000 square feet of slope face and/or approximately every 10 feet of vertical height of slope.

7.2.8. Backdrains shall be provided in fill slopes in accordance with the details presented on Figure A of these guidelines, or as recommended by the geotechnical consultant.

7.3. Top-of-Slope Drainage

7.3.1. For pad areas above slopes, positive drainage shall be established away from the top of slope. This may be accomplished utilizing a berm and pad gradient of 2 percent or steeper at the top-of-slope areas. Site runoff shall not be permitted to flow over the tops of slopes.

7.3.2. Gunite-lined brow ditches shall be placed at the top of cut slopes to redirect surface runoff away from the slope face where drainage devices are not otherwise provided.

7.4. Slope Maintenance

7.4.1. In order to enhance surficial slope stability, slope planting shall be accomplished at the completion of grading. Slope plants shall consist of deep-rooting, variable root depth, drought-tolerant vegetation. Native vegetation is generally desirable. Plants native to semiarid and arid areas may also be ap-

propriate. Large-leafed ice plant should not be used on slopes. A landscape architect shall be consulted regarding the actual types of plants and planting configuration to be used.

7.4.2. Irrigation pipes shall be anchored to slope faces and not placed in trenches excavated into slope faces. Slope irrigation shall be maintained at a level just sufficient to support plant growth. Property owners shall be made aware that over watering of slopes is detrimental to slope stability. Slopes shall be monitored regularly and broken sprinkler heads and/or pipes shall be repaired immediately.

7.4.3. Periodic observation of landscaped slope areas shall be planned and appropriate measures taken to enhance growth of landscape plants.

7.4.4. Graded swales at the top of slopes and terrace drains shall be installed and the property owners notified that the drains shall be periodically checked so that they may be kept clear. Damage to drainage improvements shall be repaired immediately. To reduce siltation, terrace drains shall be constructed at a gradient of 3 percent or steeper, in accordance with the recommendations of the project civil engineer.

7.4.5. If slope failures occur, the geotechnical consultant shall be contacted immediately for field review of site conditions and development of recommendations for evaluation and repair.

8. TRENCH BACKFILL

The following sections provide recommendations for backfilling of trenches.

8.1. Trench backfill shall consist of granular soils (bedding) extending from the trench bottom to 1 or more feet above the pipe. On-site or imported fill which has been evaluated by the geotechnical consultant may be used above the granular backfill. The cover soils directly in contact with the pipe shall be classified as having a very low expansion potential, in accordance with UBC Standard 18-2, and shall contain no rocks or chunks of hard soil larger than 3/4-inch in diameter.

8.2. Trench backfill shall, unless otherwise recommended, be compacted by mechanical means to 90 percent or greater relative compaction as evaluated in accordance with ASTM D 1557-02. Backfill soils shall be placed in loose lifts 8-inches thick or thinner, moisture conditioned, and compacted in accordance with the recommendations of Section 5. of these guidelines. The backfill shall be tested by the geotechnical consultant at vertical intervals of approximately 2 feet of backfill placed and at spacings along the trench of approximately 100 feet in the same lift.

8.3. Jetting of trench backfill materials is generally not a recommended method of densification, unless the on-site soils are sufficiently free-draining and provisions have been made for adequate dissipation of the water utilized in the jetting process.

8.4. If it is decided that jetting may be utilized, granular material with a sand equivalent greater than 30 shall be used for backfilling in the areas to he jetted. Jetting shall generally be considered for trenches 2 feet or narrower in width and 4 feet or shallower in depth. Following jetting operations, trench backfill shall be mechanically compacted to the specified compaction to finish grade.

8.5. Trench backfill which underlies the zone of influence of foundations shall be mechanically compacted to 90 percent or greater relative compaction, as evaluated in accordance with ASTM D 1557-02. The zone of influence of the foundations is generally defined as the roughly triangular area within the limits of a 1:1 projection from the inner and outer edges of the foundation, projected down and out from both edges.

8.6. Trench backfill within slab areas shall be compacted by mechanical means to a relative compaction of 90 percent or greater relative compaction, as evaluated in accordance with ASTM D 1557-02. For minor interior trenches, density testing may be omitted or spot testing may be performed, as deemed appropriate by the geotechnical consultant.

8.7. When compacting soil in close proximity to utilities, care shall be taken hy the grading contractor so that mechanical methods used to compact the soils do not damage the utilities. If the utility contractors indicate that it is undesirable to use compaction equipment in close proximity to a buried conduit, then the grading contractor may elect to use light mechanical compaction equipment or, with the approval of the geotechnical consultant, cover the conduit with clean granular material. These granular materials shall be jetted in place to the top of the conduit in accordance with the recommendations of Section 8.4 prior to initiating mechanical compaction procedures. Other methods of utility trench compaction may also be appropriate, upon review by the geotechnical consultant and the utility contractor, at the time of construction.

8.8. Clean granular backfill and/or bedding materials are not recommended for use in slope areas unless provisions are made for a drainage system to mitigate the potential for buildup of seepage forces or piping of backfill materials.

8.9. The contractor shall exercise the specified safety precautions, in accordance with OSHA Trench Safety Regulations, while conducting trenching operations. Such precautions include shoring or laying back trench excavations at 1:1 or flatter, depending on material type, for trenches in excess of 5 feet in depth. The geotechnical consultant is not responsible for the safety of trench operations or stability of the trenches.

9. DRAINAGE

The following sections provide recommendations pertaining to site drainage.

9.1. Canyon subdrain systems recommended by the geotechnical consultant shall be installed in accordance with the Canyon Subdrain Detail, Figure C, provided in these guidelines. Canyon subdrains shall be installed to conform to the approximate alignment and details shown on project plans. The actual subdrain location shall be evaluated by the geotechnical consultant in the field during grading. Materials specified in the attached Canyon Subdrain Detail shall not be changed or modified unless so recommended by the geotechnical consultant. Subdrains shall be surveyed by a licensed land surveyor/civil engineer for line and grade after installation. Sufficient time shall be allowed for the surveys prior to commencement of filling over the subdrains.

9.2. Typical backdrains for stability, side hill, and shear key fills shall be installed in accordance with the details provided on Figure A, Figure F, and Figure G of these guidelines.

9.3. Roof, pad, and slope drainage shall be such that it is away from slopes and structures to suitable discharge areas by nonerodible devices (e.g., gutters, downspouts, concrete swales, etc.).

9.4. Positive drainage adjacent to structures shall be established and maintained. Positive drainage may be accomplished by providing drainage away from the foundations of the structure at a gradient of 2 percent or steeper for a distance of 5 feet or more outside the building perimeter, further maintained by a graded swale leading to an appropriate outlet, in accordance with the recommendations of the project civil engineer and/or landscape architect.

9.5. Surface drainage on the site shall be provided so that water is not permitted to pond. A gradient of 2 percent or steeper shall be maintained over the pad area and drainage patterns shall be established to remove water from the site to an appropriate outlet.

9.6. Care shall be taken by the contractor during finish grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices of a permanent nature on or adjacent to the property. Drainage patterns established at the time of finish grading shall be maintained for the life of the project. Property owners shall be made very clearly aware that altering drainage patterns may be detrimental to slope stability and foundation performance.

10. SITE PROTECTION

The site shall be protected as outlined in the following sections.

10.1. Protection of the site during the period of grading shall be the responsibility of the contractor unless other provisions are made in writing and agreed upon among the concerned parties. Completion of a portion of the project shall not be considered to preclude that portion or adjacent areas from the need for site protection, until such time as the project is finished as agreed upon by the geotechnical consultant, the client, and the regulatory agency.

10.2. The contractor is responsible for the stability of temporary excavations. Recommendations by the geotechnical consultant pertaining to temporary excavations are made in consideration of stability of the finished project and, therefore, shall not be considered to preclude the responsibilities of the contractor. Recommendations by the geotechnical consultant shall also not be considered to preclude more restrictive requirements by the applicable regulatory agencies.

10.3. Precautions shall be taken during the performance of site clearing, excavation, and grading to protect the site from flooding, ponding, or inundation by surface runoff. Temporary provisions shall be made during the rainy season so that surface runoff is away from and off the working site. Where low areas cannot be avoided, pumps shall be provided to remove water as needed during periods of rainfall.

10.4. During periods of rainfall, plastic sheeting shall be used as needed to reduce the potential for unprotected slopes to become saturated. Where needed, the contractor shall install check dams, desilting basins, riprap, sandbags or other appropriate devices or methods to reduce erosion and provide the recommended conditions during inclement weather.

10.5. During periods of rainfall, the geotechnical consultant shall be kept informed by the contractor of the nature of remedial or precautionary work being performed on site (e.g., pumping, placement of sandbags or plastic sheeting, other labor, dozing, etc.).

10.6. Following periods of rainfall, the contractor shall contact the geotechnical consultant and arrange a walk-over of the site in order to visually assess rain-related damage. The geotechnical consultant may also recommend excavation and testing in order to aid in the evaluation. At the request of the geotechnical consultant, the contractor shall make excavations in order to aid in evaluation of the extent of rain-related damage.

10.7. Rain- or irrigation-related damage shall be considered to include, but may not be limited to, erosion, silting, saturation, swelling, structural distress, and other adverse conditions noted by the geotechnical consultant. Soil adversely affected shall be classified as "Unsuitable Material" and shall be subject to overexcavation and

replacement with compacted fill or to other remedial grading as recommended by the geotechnical consultant.

10.8. Relatively level areas where saturated soils and/or erosion gullies exist to depths greater than 1 foot shall be overexcavated to competent materials as evaluated by the geotechnical consultant. Where adverse conditions extend to less than 1 foot in depth, saturated and/or eroded materials may be processed in-place. Overexcavated or in-place processed materials shall be moisture conditioned and compacted in accordance with the recommendations provided in Section 5. If the desired results are not achieved, the affected materials shall be overexcavated, moisture conditioned, and compacted until the specifications are met.

10.9. Slope areas where saturated soil and/or erosion gullies exist to depths greater than 1 foot shall be overexcavated and replaced as compacted fill in accordance with the applicable specifications. Where adversely affected materials exist to depths of 1 foot or less below proposed finished grade, remedial grading by moisture conditioning in-place and compaction in accordance with the appropriate specifications may be attempted. If the desired results are not achieved, the affected materials shall be overexcavated, moisture conditioned, and compacted until the specifications are met. As conditions dictate, other slope repair procedures may also be recommended by the geotechnical consultant.

10.10. During construction, the contractor shall grade the site to provide positive drainage away from structures and to keep water from ponding adjacent to structures. Water shall not be allowed to damage adjacent properties. Positive drainage shall be maintained by the contractor until permanent drainage and erosion reducing devices are installed in accordance with project plans.

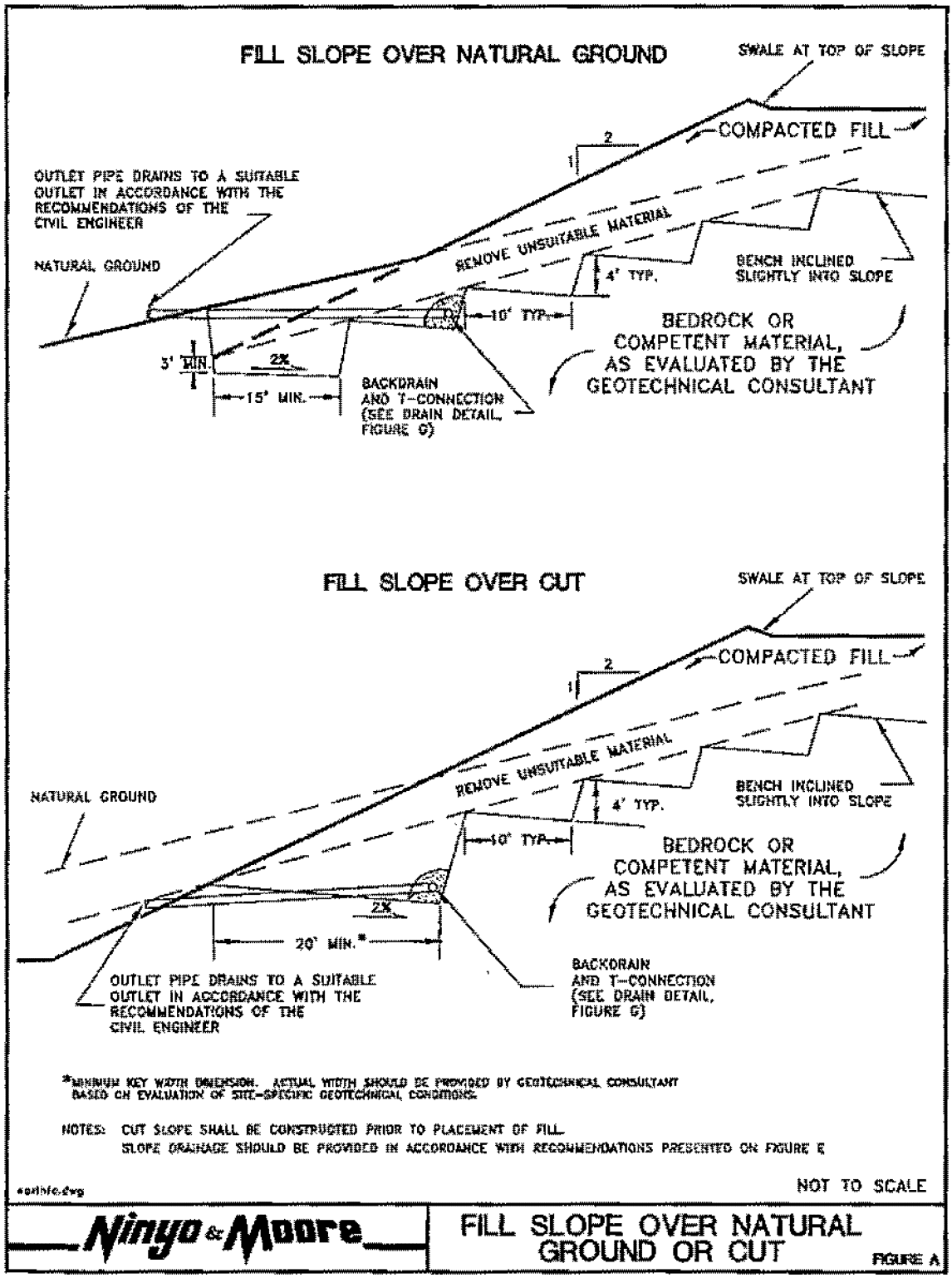
11. DEFINITIONS OF TERMS

ALLUVIUM:	Unconsolidated detrital deposits deposited by flowing water; includes sediments deposited in river beds, canyons, flood plains, lakes, fans at the foot of slopes, and in estuaries.
AS-GRADED (AS-BUILT):	The site conditions upon completion of grading.
BACKCUT:	A temporary construction slope at the rear of earth-retaining structures such as buttresses, shear keys, stabilization fills, or retaining walls.
BACKDRAIN:	Generally a pipe-and-gravel or similar drainage system placed behind earth-retaining structures such as buttresses, stabilization fills, and retaining walls.
BEDROCK:	Relatively undisturbed in-place rock, either at the surface or beneath surficial deposits of soil.
BENCH:	A relatively level step and near-vertical riser excavated into sloping ground on which fill is to be placed.
BORROW (IMPORT):	Any fill material hauled to the project site from off-site areas.
BUTTRESS FILL:	A fill mass, the configuration of which is designed by engineering calculations, to retain slopes containing adverse geologic features. A buttress is generally specified by a key width and depth and by a backcut angle. A buttress normally contains a back drainage system.
CIVIL ENGINEER:	The Registered Civil Engineer or consulting firm responsible for preparation of the grading plans and surveying, and evaluating as-graded topographic conditions.
CLIENT:	The developer or a project-responsible authorized representative. The client has the responsibility of reviewing the findings and recommendations made by the geotechnical consultant and authorizing the contractor and/or other consultants to perform work and/or provide services.
COLLUVIUM:	Generally loose deposits, usually found on the face or near the base of slopes and brought there chiefly by gravity through slow continuous downhill creep (see also Slope Wash).
COMPACTION:	The densification of a fill by mechanical means.

CONTRACTOR:	A person or company under contract or otherwise retained by the client to perform demolition, grading, and other site improvements.
DEBRIS:	The products of clearing, grubbing, and/or demolition, or contaminated soil material unsuitable for reuse as compacted fill, and/or any other material so designated by the geotechnical consultant.
ENGINEERED FILL:	A fill which the geotechnical consultant or the consultant's representative has observed and/or tested during placement, enabling the consultant to conclude that the fill has been placed in substantial compliance with the recommendations of the geotechnical consultant and the governing agency requirements.
ENGINEERING GEOLOGIST:	A geologist registered by the state licensing agency who applies geologic knowledge and principles to the exploration and evaluation of naturally occurring rock and soil, as related to the design of civil works.
EROSION:	The wearing away of the ground surface as a result of the movement of wind, water, and/or ice.
EXCAVATION:	The mechanical removal of earth materials.
EXISTING GRADE:	The ground surface configuration prior to grading; original grade.
FILL:	Any deposit of soil, rock, soil-rock blends, or other similar materials placed by man.
FINISH GRADE:	The as-graded ground surface elevation that conforms to the grading plan.
GEOFABRIC:	An engineering textile utilized in geotechnical applications such as subgrade stabilization and filtering.
GEOTECHNICAL CONSULTANT:	The geotechnical engineering and engineering geology consulting firm retained to provide technical services for the project. For the purpose of these specifications, observations by the geotechnical consultant include observations by the geotechnical engineer, engineering geologist and other persons employed by and responsible to the geotechnical consultant.

GEOTECHNICAL ENGINEER:	A licensed civil engineer and geotechnical engineer, registered by the state licensing agency, who applies scientific methods, engineering principles, and professional experience to the acquisition, interpretation, and use of knowledge of materials of the earth's crust to the resolution of engineering problems. Geotechnical engineering encompasses many of the engineering aspects of soil mechanics, rock mechanics, geology, geophysics, hydrology, and related sciences.
GRADING:	Any operation consisting of excavation, filling, or combinations thereof and associated operations.
LANDSLIDE DEPOSITS:	Material, often porous and of low density, produced from instability of natural or manmade slopes.
OPTIMUM MOISTURE:	The moisture content that is considered optimum to compaction operations.
RELATIVE COMPACTION:	The degree of compaction (expressed as a percentage) of a material as compared to the dry density obtained from ASTM test method D 1557-02.
ROUGH GRADE:	The ground surface configuration at which time the surface elevations approximately conform to the approved plan.
SHEAR KEY:	Similar to a subsurface buttress; however, it is generally constructed by excavating a slot within a natural slope in order to stabilize the upper portion of the slope without encroaching into the lower portion of the slope.
SITE:	The particular parcel of land where grading is being performed.
SLOPE:	An inclined ground surface, the steepness of which is generally specified as a ratio of horizontal units to vertical units.
SLOPE WASH:	Soil and/or rock material that has been transported down a slope by gravity assisted by the action of water not confined to channels (see also Colluvium).
SLOUGH:	Loose, uncompacted fill material generated during grading operations.
SOIL:	Naturally occurring deposits of sand, silt, clay, etc., or combinations thereof.

STABILIZATION FILL:	A fill mass, the configuration of which is typically related to slope height and is specified by the standards of practice for enhancing the stability of locally adverse conditions. A stabilization fill is normally specified by a key width and depth and by a backcut angle. A stabilization fill may or may not have a back drainage system specified.
SUBDRAIN:	Generally a pipe-and-gravel or similar drainage system placed beneath a fill along the alignment of buried canyons or former drainage channels.
TAILINGS:	Non-engineered fill which accumulates on or adjacent to equipment haul roads.
TERRACE:	A relatively level bench constructed on the face of a graded slope surface for drainage and maintenance purposes.
TOPSOIL:	The upper zone of soil or bedrock materials, which is usually dark in color, loose, and contains organic materials.
WINDROW:	A row of large rocks buried within engineered fill in accordance with guidelines set forth by the geotechnical consultant.


FILL SLOPE OVER NATURAL GROUND
SWALE AT TOP OF SLOPE
COMPACTED FILL
2
1
OUTLET PIPE DRAINS TO A SUITABLE OUTLET IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE CIVIL ENGINEER
NATURAL GROUND
REMOVE UNSUITABLE MATERIAL
4' TYP.
BENCH INCLINED SLIGHTLY INTO SLOPE
10' TYP.
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
3' MIN.
2%
15' MIN.
BACKDRAIN AND T-CONNECTION (SEE DRAIN DETAIL, FIGURE G)
FILL SLOPE OVER CUT
SWALE AT TOP OF SLOPE
COMPACTED FILL
2
1
NATURAL GROUND
REMOVE UNSUITABLE MATERIAL
4' TYP.
BENCH INCLINED SLIGHTLY INTO SLOPE
10' TYP.
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
2%
20' MIN.*
OUTLET PIPE DRAINS TO A SUITABLE OUTLET IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE CIVIL ENGINEER
BACKDRAIN AND T-CONNECTION (SEE DRAIN DETAIL, FIGURE G)
*MINIMUM KEY WIDTH DIMENSION. ACTUAL WIDTH SHOULD BE PROVIDED BY GEOTECHNICAL CONSULTANT BASED ON EVALUATION OF SITE-SPECIFIC GEOTECHNICAL CONDITIONS.
NOTES: CUT SLOPE SHALL BE CONSTRUCTED PRIOR TO PLACEMENT OF FILL.
SLOPE DRAINAGE SHOULD BE PROVIDED IN ACCORDANCE WITH RECOMMENDATIONS PRESENTED ON FIGURE E
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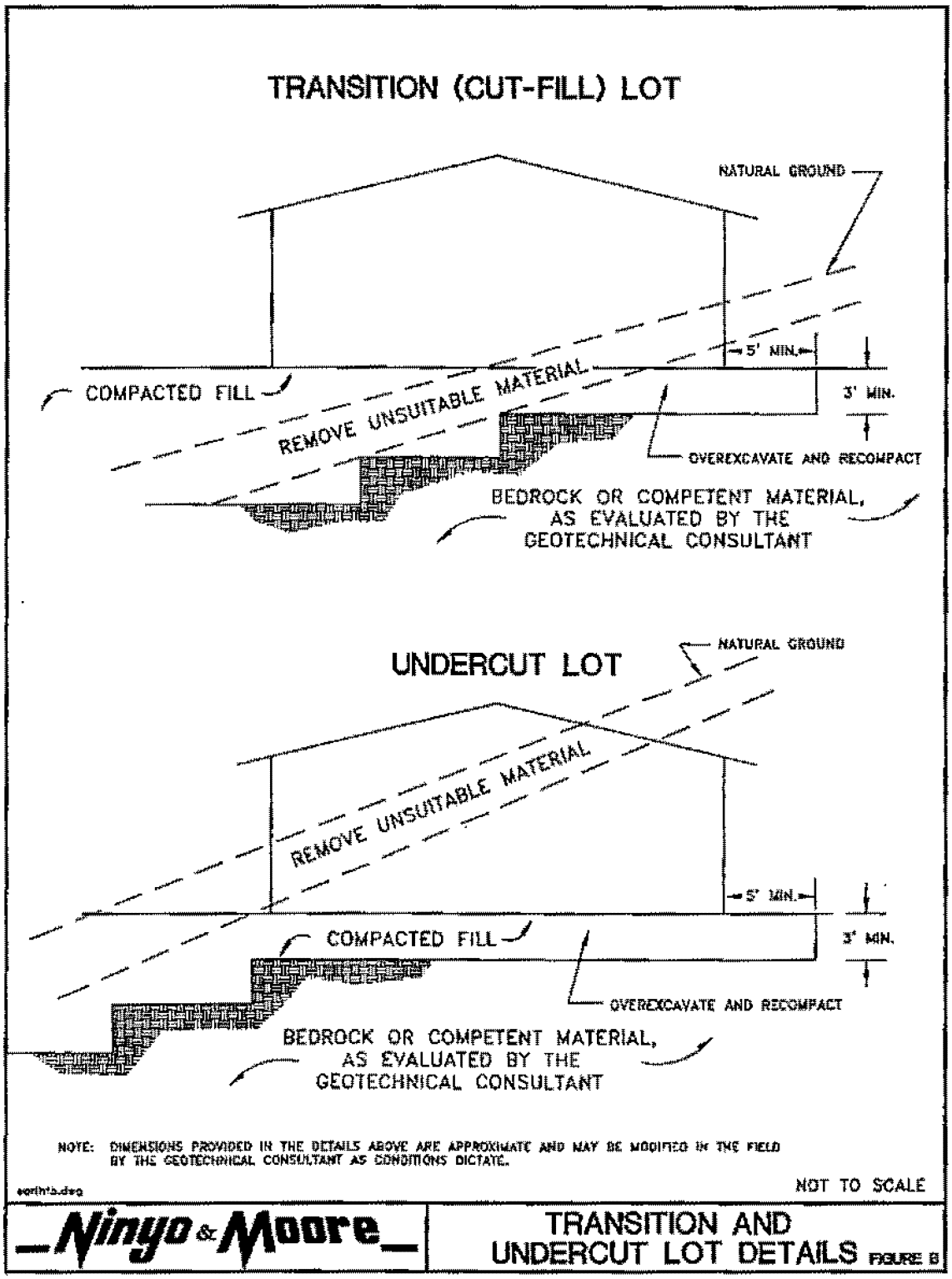
NOT TO SCALE
Ninyo & Moore
FILL SLOPE OVER NATURAL GROUND OR CUT
FIGURE A


TRANSITION (CUT-FILL) LOT
NATURAL GROUND
5' MIN.
3' MIN.
COMPACTED FILL
REMOVE UNSUITABLE MATERIAL
OVEREXCAVATE AND RECOMPACT
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
UNDERCUT LOT
NATURAL GROUND
REMOVE UNSUITABLE MATERIAL
5' MIN.
3' MIN.
COMPACTED FILL
OVEREXCAVATE AND RECOMPACT
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
NOTE: DIMENSIONS PROVIDED IN THE DETAILS ABOVE ARE APPROXIMATE AND MAY BE MODIFIED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT AS CONDITIONS DICTATE.
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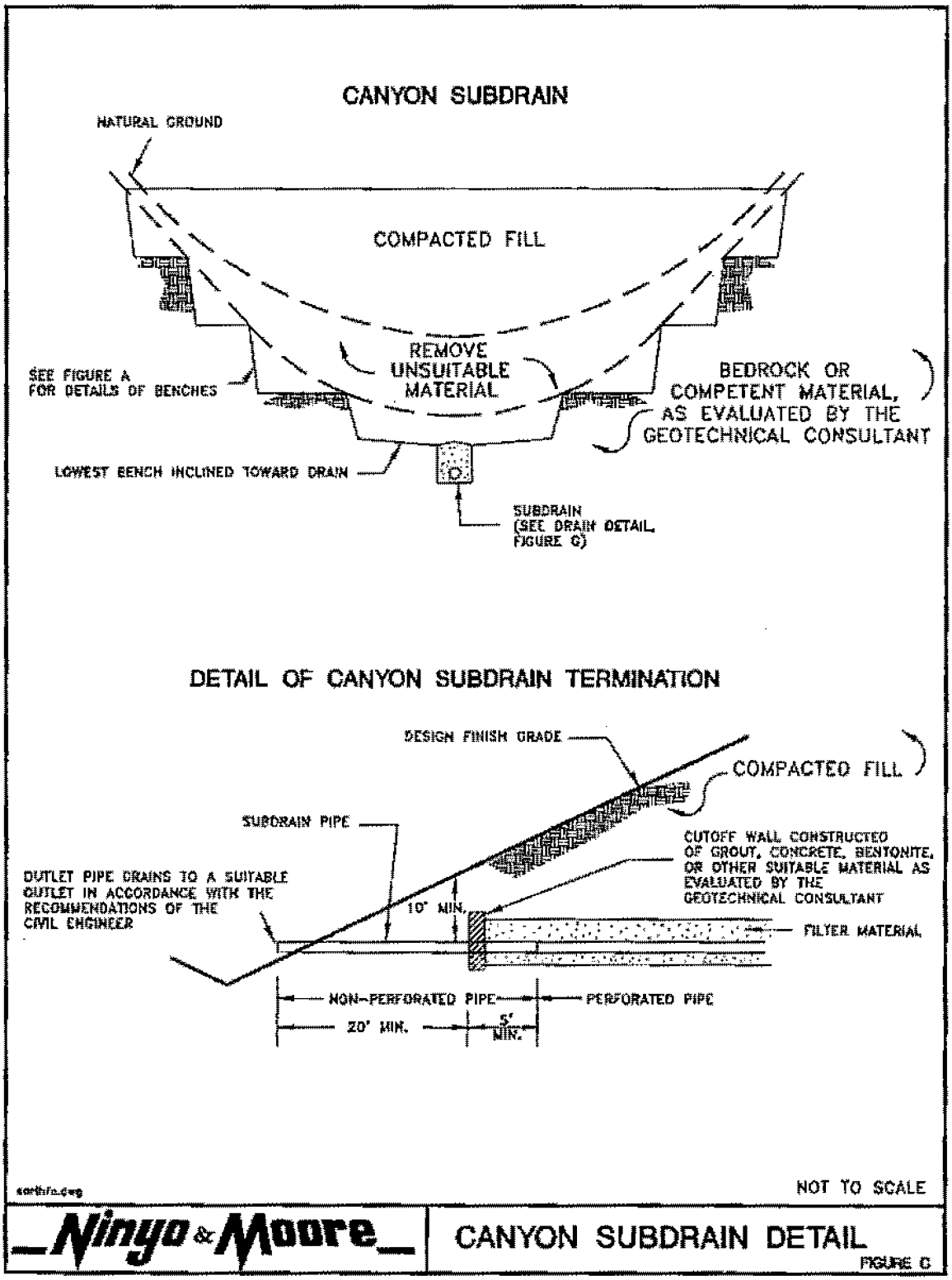
NOT TO SCALE
Ninyo & Moore
TRANSITION AND UNDERCUT LOT DETAILS
FIGURE 8


CANYON SUBDRAIN
NATURAL GROUND
COMPACTED FILL
REMOVE UNSUITABLE MATERIAL
SEE FIGURE A FOR DETAILS OF BENCHES
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
LOWEST BENCH INCLINED TOWARD DRAIN
SUBDRAIN (SEE DRAIN DETAIL, FIGURE C)
DETAIL OF CANYON SUBDRAIN TERMINATION
DESIGN FINISH GRADE
COMPACTED FILL
SUBDRAIN PIPE
CUTOFF WALL CONSTRUCTED OF GROUT, CONCRETE, BENTONITE, OR OTHER SUITABLE MATERIAL AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
OUTLET PIPE DRAINS TO A SUITABLE OUTLET IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE CIVIL ENGINEER
10' MIN.
FILTER MATERIAL
NON-PERFORATED PIPE
PERFORATED PIPE
20' MIN.
5' MIN.
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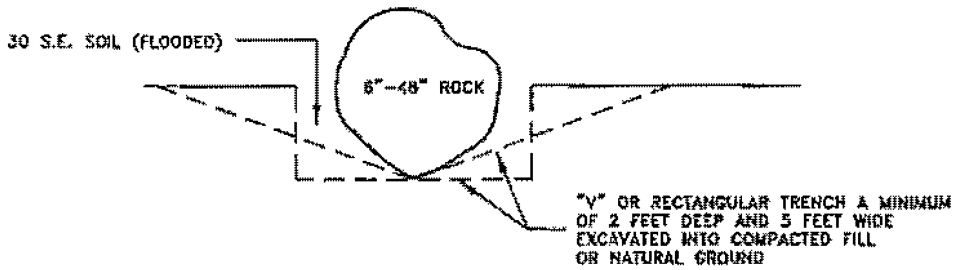
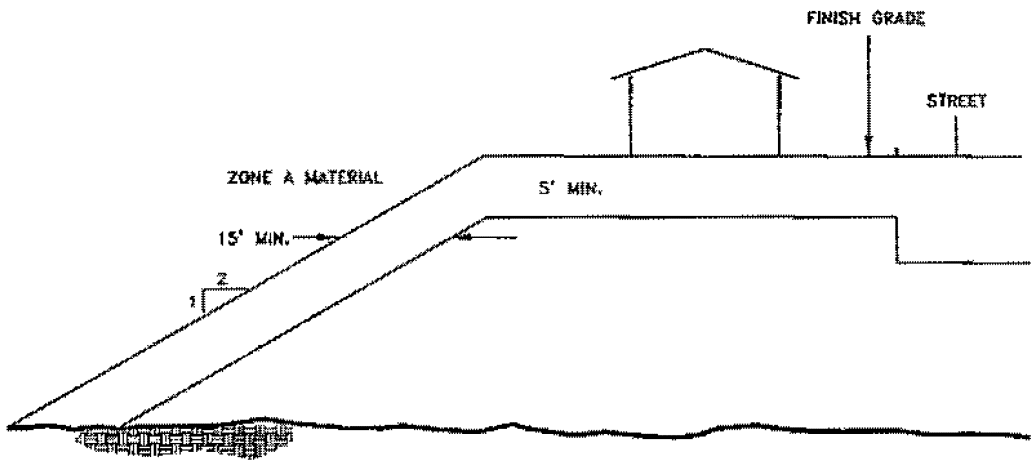
NOT TO SCALE
Ninyo & Moore
CANYON SUBDRAIN DETAIL
FIGURE C

WINDROW SECTION



PAD SECTION



ZONE A: COMPACTED FILL WITH ROCK FRAGMENTS NO GREATER THAN 6 INCHES IN DIAMETER.

ZONE B: COMPACTED FILL WITH ROCK FRAGMENTS BETWEEN 6 AND 48 INCHES IN DIAMETER MAY BE PLACED IN STAGGERED WINDROWS UP TO 100' LONG IN THIS ZONE AND SURROUNDED BY GRANULAR SOIL (30 SAND EQUIVALENT) DENSIFIED BY FLOODING. ROCK FRAGMENTS LESS THAN 6 INCHES IN DIAMETER MAY BE PLACED IN COMPACTED FILL SOIL.

NOTE: SLOPE DRAINAGE SHOULD BE PROVIDED IN ACCORDANCE WITH RECOMMENDATIONS PRESENTED ON FIGURE E.

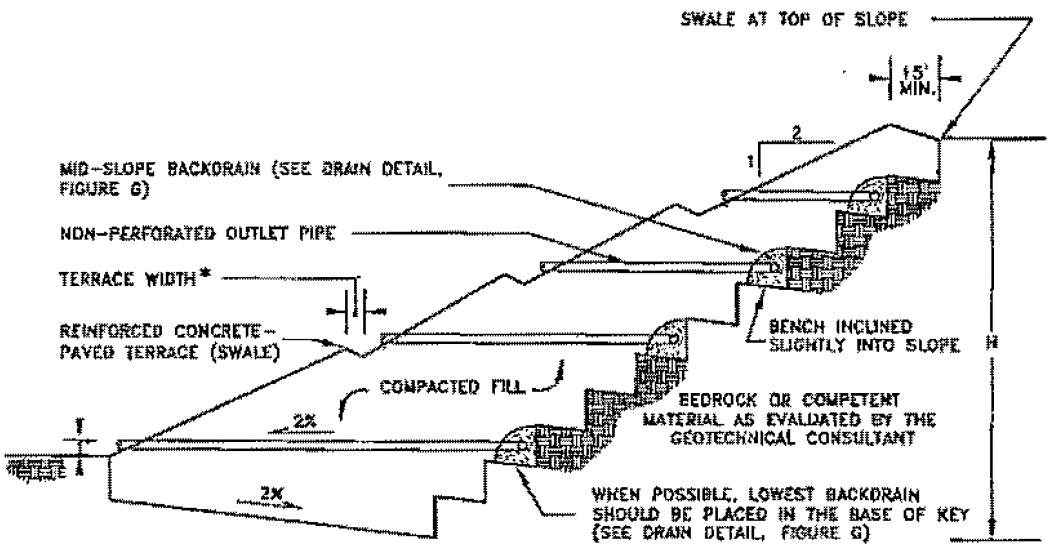
earthfd slope.dwg

NOT TO SCALE

Ninyo & Moore

OVERSIZED ROCK PLACEMENT DETAIL

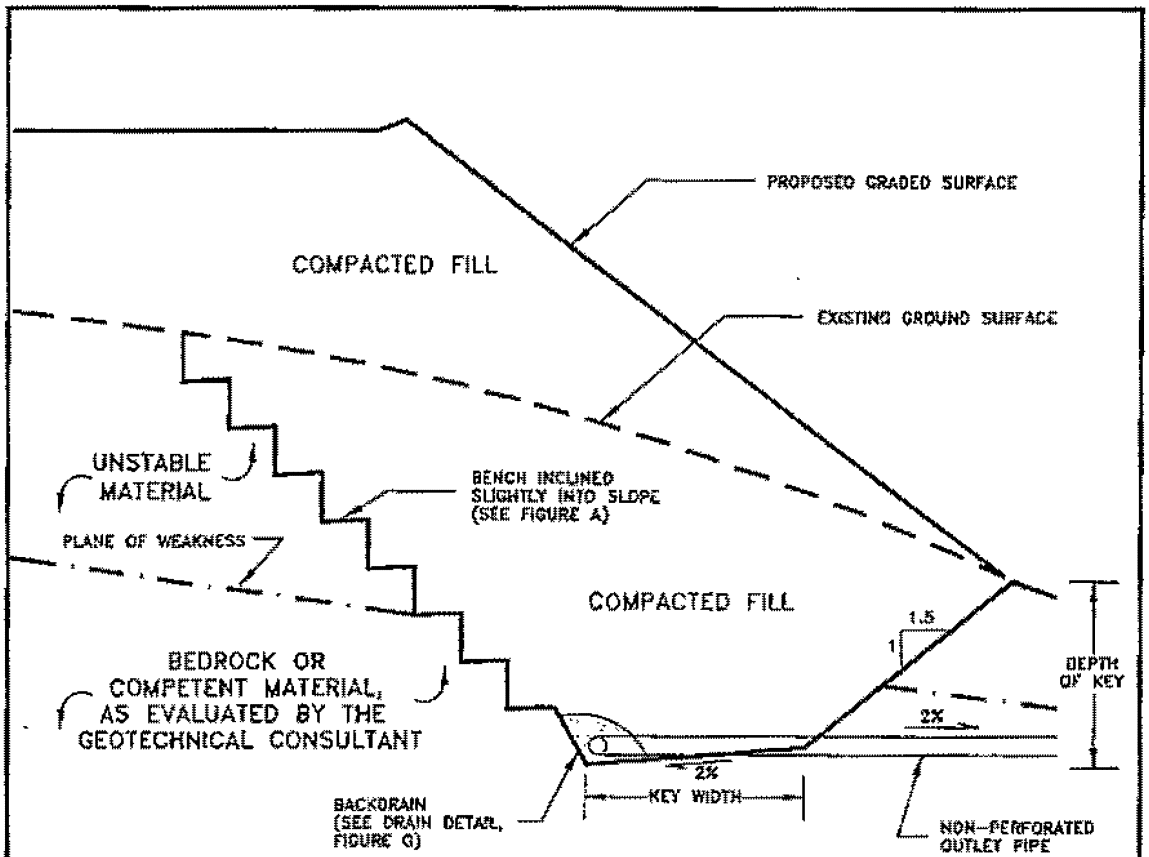
FIGURE D



MAXIMUM VERTICAL SLOPE HEIGHT, H (FEET)	* TERRACE WIDTH AND LOCATION
LESS THAN 30	NO TERRACE REQUIRED
60	ONE TERRACE AT LEAST 6 FEET WIDE AT MIDHEIGHT
120	ONE TERRACE AT LEAST 12 FEET WIDE AT APPROXIMATELY MIDHEIGHT AND 6-FOOT WIDE TERRACES CENTERED IN REMAINING SLOPES
GREATER THAN 120	DESIGNED BY CIVIL ENGINEER WITH APPROVAL OF GOVERNING AUTHORITIES

NOTES:
1. MID-SLOPE BACKDRAINS SHOULD BE PLACED IN FILL SLOPES IN CONJUNCTION WITH EACH TERRACE.
2. TERRACES SHOULD HAVE AT LEAST A 5-PERCENT GRADIENT, AND RUN OFF SHOULD BE DIRECTED TO AN APPROPRIATE SURFACE DRAINAGE COLLECTOR.
3. TERRACES SHOULD BE CLEANED OF DEBRIS AND VEGETATION TO ALLOW UNRESTRICTED FLOW OF WATER.
4. TERRACES SHOULD BE KEPT IN GOOD REPAIR.
5. REFER TO UBC CHAPTER 70 FOR ADDITIONAL REQUIREMENTS.

NOT TO SCALE



NOTES:
1. THE DEPTH AND WIDTH OF KEY WILL BE PROVIDED BY THE GEOTECHNICAL CONSULTANT BASED ON ANALYSIS OF SITE-SPECIFIC GEOTECHNICAL CONDITIONS.
2. AN ADDITIONAL MID-SLOPE BACKDRAIN AND TERRACE DRAIN MAY BE RECOMMENDED FOR SLOPES OVER 30 FEET HIGH. SEE SLOPE DRAINAGE DETAIL, FIGURE E.
3. SLOPE DRAINAGE SHOULD BE PROVIDED IN ACCORDANCE WITH RECOMMENDATIONS PRESENTED ON FIGURE E.

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NOT TO SCALE

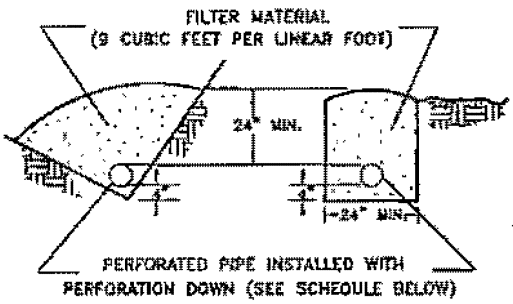
Ninyo & Moore

SHEAR KEY DETAIL

FIGURE F

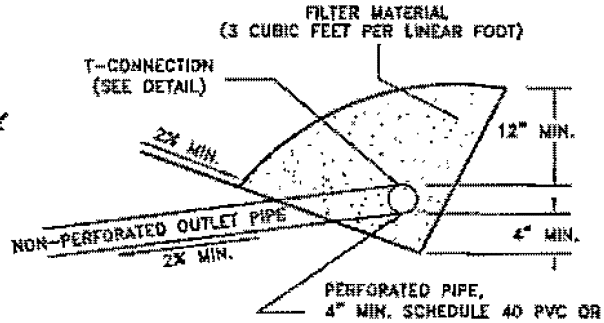
SUBDRAIN CONFIGURATION

ALTERNATIVE A* ALTERNATIVE B

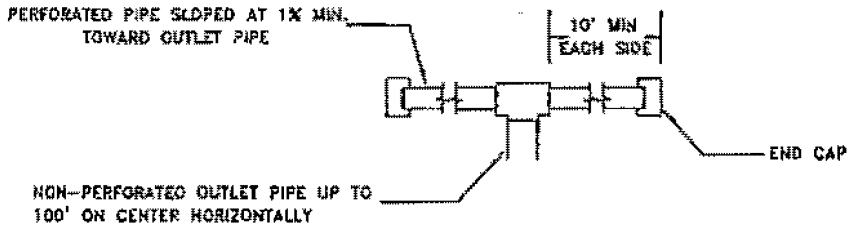


* ALTERNATIVE A SUBDRAIN CONFIGURATION MAY BE USED IN FILLS LESS THAN 25 FEET DEEP

BACKDRAIN CONFIGURATION



T-CONNECTION DETAIL



FILTER MATERIAL

FILTER MATERIAL SHALL BE CLASS II PERMEABLE MATERIAL PER STATE OF CALIFORNIA STANDARD SPECIFICATIONS OR APPROVED ALTERNATE GEOFABRIC DRAIN SYSTEM.

CLASS II GRADATIONS

SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	90-100
3/8"	40-100
No. 4	25-40
No. 8	18-33
No. 30	5-15
No. 50	0-7
No. 200	0-3

NOTE: AS AN ALTERNATIVE THE FILTER MATERIAL MAY CONSIST OF UP TO 1" DIAMETER OPEN-GRADED GRAVEL WRAPPED IN AN APPROVED GEOFABRIC WITH 6-INCH OR MORE OVERLAP.

PIPE SCHEDULE

PERFORATED AND NON-PERFORATED PIPE SHALL BE SCHEDULE 40 POLYVINYL CHLORIDE (PVC) OR ACRYLONITRILE BUTADIENE STYRENE (ABS) OR EQUIVALENT, AND WILL HAVE A MINIMUM CRUSHING STRENGTH OF 1000 PSI FOR DEPTHS OF FILL UP TO 50 FEET. FOR DEEPER FILLS, PERFORATED AND NON-PERFORATED PIPE SHOULD BE DESIGNED WITH ADEQUATE CRUSHING STRENGTH.

THE PIPE DIAMETER WILL GENERALLY MEET THE FOLLOWING CRITERIA, BUT MAY BE MODIFIED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT AS CONDITIONS DICTATE. THE LENGTH OF RUN IS MEASURED FROM THE HIGHEST ELEVATION.

LENGTH OF RUN	PIPE DIAMETER
0-500'	4"
500-1500'	6"
> 1500'	8"

NOT TO SCALE

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Ninyo & Moore

DRAIN DETAIL

FIGURE 8

APPENDIX E

CORROSION ANALYSIS

PRELIMINARY SOIL CORROSIVITY REPORT
SWEETWATER AUTHORITY
PURDUE WATER TREATMENT PLANT

Prepared by: DeC Consultants, Inc.
DeC Project No. 043918
July 12, 2005

INTRODUCTION

DeC Consultants, Inc. (DeC) has completed the soil corrosivity testing at the Sweetwater Authority Purdue Water Treatment Plant (WTP) site. The site is located north of the Sweetwater Reservoir Dam on Lake View Drive in Spring Valley, California. Testing and analysis consists of an onsite Wenner 4-Pin soil resistivity survey and a complete analysis of soil samples.

This corrosivity study is defined as part of Phase 1 of the corrosion engineering services provided by DeC. The objective of this corrosivity study is to determine the relative corrosivity of soils and the effect of soil corrosivity on buried metallic plant piping that will be installed as part of the Purdue WTP upgrades. The other objective of Phase 1 is to recommend corrosion control measures for metallic piping. These specific corrosion control measures will be submitted after DeC's detailed review of Montgomery Watson Harza's (MWH) preliminary design report (PDR).

TEST RESULTS AND CONCLUSIONS

1. The Wenner 4-pin testing done on July 8, 2005 included resistivity measurements at eight locations within the area where new WTP upgrades are planned. A total of forty resistivity readings were obtained within the property (see Table 1). Twenty-nine of the forty readings (73%) were above 4000 ohm-cm which indicates conditions ranging from "mildly corrosive" to "slightly corrosive." Nine of the forty readings (22%) indicate conditions that are "moderately corrosive." The remaining two readings (5%) were less than 2000 ohm-cm and indicate that conditions that are "fairly corrosive."

2. Soil samples from the building sites were taken before the site was graded. The results of the soil compositional analysis conducted on four soils samples indicated low levels of critical soluble ion concentrations (see Table 2). Chloride concentrations were low ranging from 31 mg/L to 72 mg/L in all four soil samples. Sulfate levels are low ranging from 0 mg/L (below detectable levels) to 149 mg/L. Bicarbonate concentrations were higher ranging from 175 to 599 ppm. The soil pH readings were indicative of slightly alkaline conditions.

DISCUSSION

The corrosion and performance of buried metallic piping in WTP facilities may be influenced by a number of factors. These include soil conductivity (or resistivity), the cleanliness and uniformity of the backfill, the type and performance of the coatings or encasement, the care with which coatings or encasements are protected from damage, the location to other utilities when installed, and temperature. High soil corrosivity exacerbates the affect of all of these factors.

Soil Resistivity

The soil property that is most representative of corrosivity is electrical resistivity. Since corrosion in an electrochemical reaction involving the flow of charged ions and electrons, the resistance or resistivity of the environment affects the rate of electron or ion flow and consequently the rate of corrosion. Corrosivity is inversely proportional to resistivity. The most common method of measuring soil resistivity is the Wenner 4-pin method. In order to assess the resistivity at the Purdue WTP site, an on-site survey was conducted.

The Wenner 4-pin method utilizes four pins or electrodes which are driven into the earth equally spaced and in a straight line. Current (I) is circulated through the outer pins and a voltage, or IR, drop is measured between the middle pins. The resistivity, an intrinsic property of the soil, is derived from the resistance and the geometry of the electrostatic field created between the outer pins. The pin spacings used in these field tests are 20 feet, 15 feet, 10 feet, 5 feet, and 2.5 feet. For this type of testing, the pin spacings are analogous to the depths at which the resistivity is averaged. Resistivities are expressed in ohm-centimeters. The lower the soil resistivity, the greater the corrosivity, assuming all other factors are equal.

The most common relationship between corrosivity and soil resistivity used by corrosion engineers in Southern California is as follows:

Corrosivity	Resistivity
Very Corrosive	0-500 ohm-cm
Corrosive	501-1000 ohm-cm
Fairly Corrosive	1001-2000 ohm-cm
Moderately Corrosive	2001-4000 ohm-cm
Mildly Corrosive	4001-10000 ohm-cm
Slightly Corrosive	10001-30000 ohm-cm
Relatively Non-corrosive	Greater than 30001 ohm-cm

It is noted that these relationships are most often applied to buried ferrous metals. They are, however, conservatively applied to copper or copper alloys, which are usually more corrosion resistant than iron.

The field soil resistivity data DeC obtained using the Wenner 4-pin Method on July 8, 2005 are listed in Table 1. Tests were run at eight locations so that a total of forty readings were

obtained. The frequency analysis bar graph (below Table 1) plots the number of occurrences of readings within the above corrosivity ranges for each depth or pin spacing.

Only two of the forty (5%) readings at all depths were less than 2000 ohm-cm. Although there is no official significance to the value of 2000 ohm-cm, it is a value that is often used to delineate highly corrosive soils. It has been DeC's experience that there is a significant probability that metallic corrosion will be initiated and supported by soils in which the majority of the resistivity readings are less than 2000 ohm-cm and the chloride concentration in the soil exceeds 300 mg/L. Clearly, the 4-pin data do not meet the 2000 ohm-cm criterion and all eight soil samples have chloride concentrations less than 72 mg/L (see below). It is noted that chloride concentration are typically proportional to conductivity and inversely proportional to resistivity.

Chemical Analysis of Soil Samples

The soil sample chemical analysis was performed to better define the corrosivity at the Purdue WTP site. DeC used soil samples collected by Ninyo & Moore on May 20, 2005. The samples were obtained from depths of two to fourteen feet. DeC analyzed a total of four separate soil samples.

DeC performed soil box analyses, moisture content, and pH measurements in DeC's lab. The samples were then prepared by mixing with distilled water and sent to an independent laboratory, Bell Geochemistry Incorporated (BGI), for chemical testing. At BGI the water extract from the samples was tested for pH, electro-conductivity (EC) and total hardness. They are also tested for chloride, sulfate and bicarbonate concentrations. The results are shown in Table 2.

Chloride and sulfate concentrations in the four soil samples were very low ranging from 31 mg/L to 72 mg/L and 0 mg/L (below detectable levels) to 149 mg/L respectively. Bicarbonate concentrations (HCO_3) were higher ranging from 175 to 599 ppm. However, bicarbonates are not particularly corrosive except possibly for copper where carbonic acid can form under certain conditions. The pH levels ranged from 7.7 to 8.8 which are indicative of slightly alkaline conditions.

The results of the chemical analysis indicated low corrosivity at the Purdue WTP site.

Table 1

SOIL RESISTIVITY RESULTS
Purdue WTP / Upgrade
Prepared by: DeC Consultants, Inc.
Test Date: 7/8/05

		Resistivity (Ohm-cm) Depth in Feet				
Site #	**Location**	**20**	**15**	**10**	**5**	**2.5**
1	were borings were taken @ weather station.	4175	3619	3275	2250	1637
2	50' N/of Weather station in grass	4213	3504	2949	4615	5903
3	50' N/of Weather station on hill in grass	8426	6607	7277	10341	7947
4	@ Weather station, were borings were taken	6473	6032	5171	3686	1814
5	On Rocky hill were borings were taken.	15703	13788	7660	3026	3591
6	On Rocky hill were borings were taken.	16086	11203	6511	3734	5027
7	@ bottom of rocky hill, were eqipment is parked	6128	5429	5017	5534	4500
8	@ bottom of rocky hill, were eqipment is parked	10226	8072	6894	6473	5597

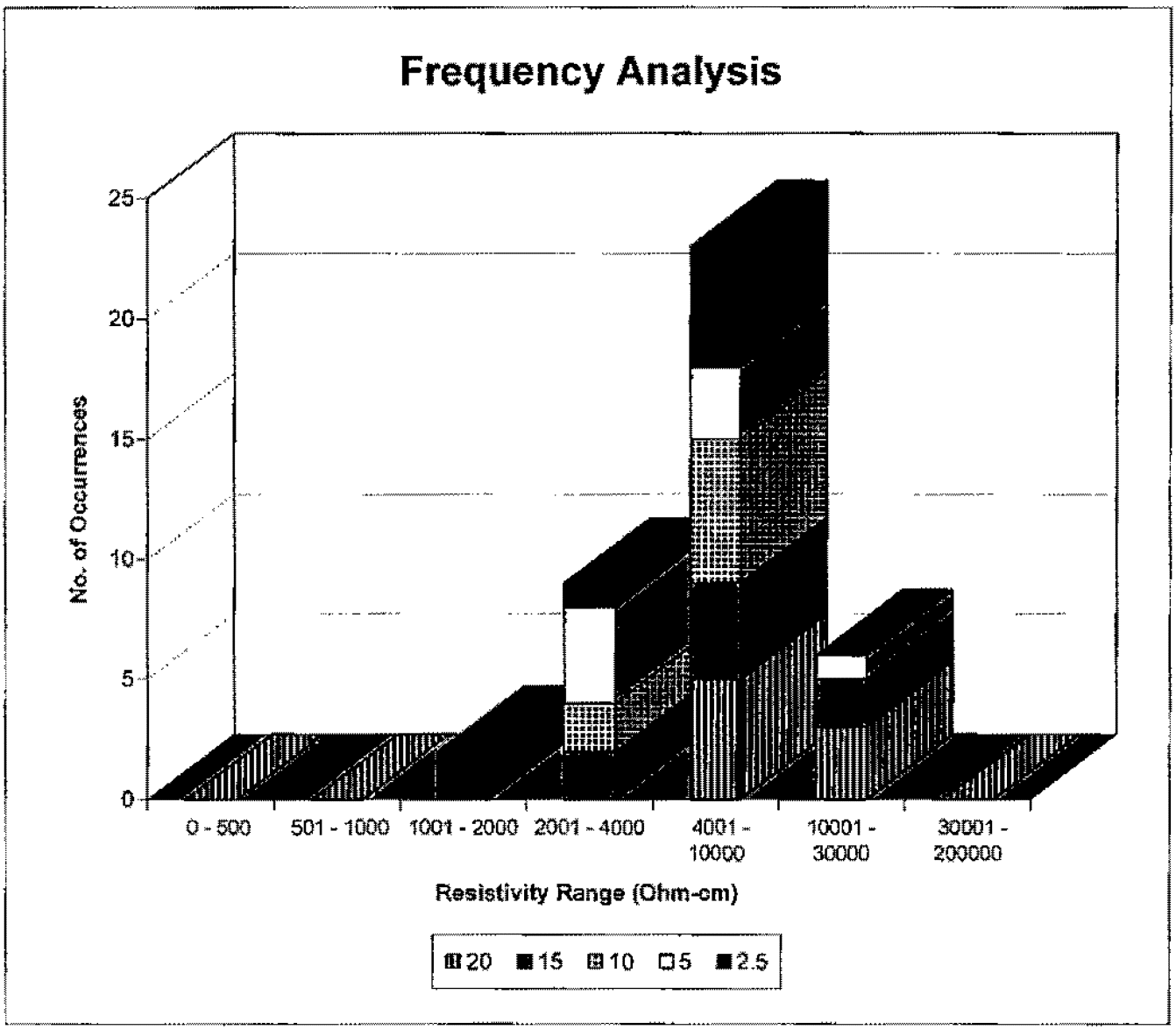

TABLE 2

SOIL CHEMICAL ANALYSIS REPORT

Purdue Water Treatment Plant Upgrades

Prepared by: DeC Consultants, Inc.

DeC Project No: 043918 Report date: 7/12/2005

Smpl ID	Sample Date	Site Description	Soil Description	Soil Box Resist.		Mst %	EC umhos	Calc R Ohms-cm	pH	Cl mg/L	SO4 mg/L	HCO3 mg/L
				Dry	Sat							
3907	5/20/2005	B-2 2'-5' depth	fine silty	22000	1500	5.7	1319	758	8.7	72	149	373
3908	5/20/2005	B-2 10'-14' depth	fine silty	2100	1600	4.9	4.9	204082	8.8	68	137	175
3909	5/20/2005	B-2a 2'-5' depth	fine silty	11000	2700	7.1	737	1357	8.5	31		400
3910	5/20/2005	B-5 2'-3' depth	small pebble fine silty	300000	1500	4.4	1330	752	7.7	71	65	599

No of samples: 4

Notes:

1. Soil box resistivity in ohm-cm is measured in the "Dry" or as recieved condition and after saturating with distilled water "Sat".
2. EC (electrical conductivity) in micro-mhos is measured in the water extract and recalculated to a 1:1 water/soil weight ratio.
3 Calc Res (calculated resistivity) is the inverse of EC in ohm-cm.

MITIGATION MONITORING AND REPORTING PROGRAM
ROBERT A. PERDUE WATER TREATMENT PLANT MASTER PLAN

BACKGROUND

Sweetwater Authority's *Master Plan for Future Plant Facilities for the Robert A. Perdue Water Treatment Plant* (Perdue WTP) proposes to upgrade the treatment process to comply with the current and proposed federal and state drinking water regulations. The improvements would occur in two phases. The Phase I improvements would be completed by fall 2009 and would involve installation of a new membrane filtration system (MFS), new pre- and post-filtration chemical feed control facility, new water pipelines and drains, and discontinued operation of the existing media filter modules. The Phase II improvements would be installed in separate work phases between 2009 and 2025 and would enable the plant to comply with additionally anticipated water quality regulations and increase the treatment capacity to 42 million gallons per day (mgd). Preliminary plans for these Phase II improvements include replacement of the existing potable water storage facility, installation of an improved pre-treatment system, construction of solids handling facilities, installation of ultraviolet disinfection, and potentially development of a hydro turbine facility for electrical power generation.. Further refinement of these proposed improvements will continue to be made as additional testing, operational experience, and design work are completed.

ENVIRONMENTAL ANALYSIS

The Program Environmental Impact Report (EIR) evaluated hydrology and water quality; air quality; noise; land use and planning; aesthetics and visual resources; biological resources; historical and archaeological resources; geology and soils; and hazards and hazardous materials. Based on the EIR analysis, the Mitigation Monitoring and Reporting Program (MMRP) has been developed to avoid or mitigate all potential project impacts to below a level of significance. Various Sweetwater Authority (SWA) staff, consultants, and contractors will be responsible for implementation of the MMRP. These responsibilities are indicated by the following abbreviations in the attached table.

SWA - PE: SWA Project Engineer
EGS - EC: SWA Environmental and Governmental Services - Environmental Coordinator
EGS - B: SWA EGS - Biologist
SWA - CM: SWA Construction Manager
SWA - SC: SWA Safety Coordinator
CCM: Contractor's Construction Manager
SWA-WQ: SWA Water Quality Maintenance Staff

Mitigation Monitoring and Reporting Program

Issue	Mitigation Measure	Timing				Responsible Party	Completed		Coordination/ Oversight
		Plans & Specs	Pre Const Grading	During Const	Post Const		Initials	Date	
2.1. Hydrology / Water Quality									
A	Ensure that the drainage facilities are properly sized and designed to control runoff and that drains are directed to sedimentation basins, swales, mechanical trapping devices, riprap or similar devices	X				SWA-PE			
B	Surface and subsurface drainage shall be designed to preclude ponding outside of areas designated for drainage containments	X				SWA- PE			
C	Stockpiles, refueling activities, and storage areas of hazardous materials (e.g., fuels, lubricants, solvents, and other potential contaminants) shall be located only at pre-designated sites with adequate pollution control, as specified in the **construction drawings** that will be displayed in the construction trailer as required in the SWPPP	X	X	X	X	CCM			SWA - CM
D	Submit a Notice of Intent (NOI) to prepare a storm water pollution prevention plan (SWPPP) and obtain coverage under the General Construction Permit	X	X			EGS-EC			SWA-PE
E	Prepare or contract preparation of SWPPP	X	X			SWA-PE CCM			EGS-EC
F	The **grading plans** shall note the condition requiring implementation of SWPPP and MMRP	X	X			SWA-PE			
G	BMPs outlined in the SWPPP shall be shown on **grading plan**	X	X			SWA-PE			
H	Prepare a construction **spill contingency plan** in accordance with County DEH regulations.for disposition of soil contaminated by spills. The plan shall be retained on-site and available for inspection throughout construction	X	X	X		SWA-PE CCM			SWA-SC
I	Implement SWPPP: • Monitor BMPs and record all monitoring • Record all SWPPP compliance and non-compliance • Record training of all appropriate staff and sub-contractors	X	X	X	X	CCM			SWA-CM
J	All appropriate contractors shall be trained in SWPPP implementation & compliance, with training documented & inserted into the SWPPP		X	X		SWA-CM			EGS
K	Exposed slopes shall be revegetated or hydro-seeded within 30 days after completion of site grading		X	X		CCM			SWA-CM

Issue	Mitigation Measure	Timing				Responsible Party	Completed		Coordination/ Oversight
		Plans & Specs	Pre Const Grading	During Const	Post Const		Initials	Date	
L	Native vegetation shall be preserved wherever feasible for immediate replacement on disturbed areas following grading. Native topsoil shall be stockpiled and reapplied as part of site reclamation					CCM			SWA CM EGS-B
M	Remove all debris and place in covered trash receptacle daily			X		CCM			SWA-CM
N	Prepare NOT upon project completion					SWA-PE			EGS-EC
O	The drainage system shall be inspected every four (4) months, and cleaned and maintained as necessary to ensure that the system functions properly			X	X	SWA –WQ			
2.2 Air Quality									
	To minimize the emissions of PM_{10}, and $PM_{2.5}$ and comply with SDAPCD Rule 51								
A	Minimize land disturbance	X	X	X		SWA-PE CM			CCM
B	Install 10 MPH signage on construction access roads and enforce					SWA-CM			CCM
C	Use watering trucks to minimize dust. Water shall be applied in sufficient amount to confine dust plumes to the project work areas		X	X					
D	Suspend grading and earth moving when wind gusts exceed 25 miles per hour unless the soil is wet enough to prevent dust plumes		X	X		CCM			
E	Cover trucks when hauling dirt and debris		X	X		CCM			SWA-CM
F	Stabilize the surface of dirt piles if not removed immediately		X	X		CCM			
G	Install a gravel bed at the terminus of unpaved roads used for construction traffic to prevent dirt track-out onto the paved road	X	X	X		SWA PE/ CM			
H	Sweep paved streets at least once per day where there is evidence dirt that has been tracked to the roadway		X	X		CCM			SWA-CM
I	Revegetate disturbed land as soon as final grade			X	X	SWA-CM			CCM
2.5 Aesthetics /Visual Resources									
A	Exterior surfaces of proposed structures shall be finished in a similar t manner to the existing Perdue WTP structures	X				SWA-PE			

Issue	Mitigation Measure	Timing				Responsible Party	Completed		Coordination/ Oversight
		Plans & Specs	Pre Const Grading	During Const	Post Const		Initials	Date	
B	All existing landscaped areas that are removed for construction staging, storage, parking, or other temporary uses shall be restored to their pre-existing or improved landscape condition	X			X	SWA-PE			EGS-B
C	Native or non-invasive trees and shrubs shall be installed to reduce the apparent bulk and scale of new structures visible from off-site residential and public open space areas	X				SWA-PE			EGS-B
D	All new exterior lighting shall be fully shielded so that the light element is not visible from any adjacent residential or public open space areas	X		X	X	SWA-PE SWA-CM			
2.6. Biological Resources									
A	The project biologist shall consult USFWS in the year immediately prior to construction to determine if updated surveys for Quino checkerspot butterfly are necessary		X			SWA			SWA-CM
B	Biologist shall review all grading and construction plans prior to commencement of grading or construction	X	X			EGS-B			SWA-CM
C	Provide a biological resources education program to construction managers and crew prior to any grading or construction, monitoring all phases of grading and construction		X			EGS-B			SWA-CM
D	Monitor all phases of grading and construction			X		EGS-B			SWA-CM
E	Assess and coordinate any project area adjustments		X	X	X	EGS-B			SWA-CM
F	Temporary exclusionary fencing shall be installed at the project brushing limits and maintained		X	X		EGS-B			SWA-CM
G	Impacts to coastal sage scrub shall be Mitigated through the HLP and the provision of replacement habitats set aside within a conservation easement through the JWA NCCP, with the SWA SAP implementing agreement providing management details. Tracking report to be provided to wildlife agencies. Alternatively, the USFWS and CDFG may authorize permanent preservation through an independent conservation easement granted to a public entity or non-profit corporation under terms satisfactory to USFWS and CDFG, which may include funding through an endowment account for maintenance and management of the conservation easement	X			X				EGS-B

Issue	Mitigation Measure	Timing				Responsible Party	Completed		Coordination/ Oversight
		Plans & Specs	Pre Const Grading	During Const	Post Const		Initials	Date	
H	In occupied coastal sage scrub, brushing activities shall be conducted between September 1 and February 15 to avoid the California gnatcatcher nesting season. Where least Bell's vireo is determined to be present, removal of vegetation shall occur between October 1 and March 15			X		CCM			EGS-B
I	Temporarily disturbed areas or manufactured slopes shall be revegetated with appropriate native species, derived from local seed sources			X		SWA-CM			EGS-B
J	Revegetated areas shall be monitored for a period of five (5) years with reports to USFWS/DFG				X	EGS-B			EGS-EC
K	The placement of 0.02 acre of riprap below the high-water level would impact wetland vegetation; however, application to the USACE shall be required for coverage under Nationwide Permit 7 for outfall structures and maintenance or Nationwide Permit 13 for bank stabilization	X	X			EGS-EC			SWA-PE
	Temporary Construction Noise Impacts								
L	The project shall be evaluated for opportunities to schedule construction activities outside of the breeding season of the California gnatcatcher and least Bell's vireo. Construction shall be scheduled to avoid the breeding season to the maximum extent practicable					SWA-CM			EGS-B
M	Construction noise exceeding 60 dBA Leq shall be minimized or avoided to the maximum extent practicable during the respective bird nesting periods for California gnatcatcher and least Bell's vireo. Possible noise abatement techniques could include, but are not limited to, the use of sound blankets, and/or the installation of noise-reducing mufflers on equipment. For construction at the MFS facility site, sound barriers (e.g., walls) are not recommended in that habitat fragmentation could be more impactive than the noise levels	X	X			SWA-PE CM			EGS-B
N	When construction during the breeding season is unavoidable, an adaptive monitoring program shall be implemented with monitoring performed by a qualified biologist possessing necessary species monitoring permits or otherwise approved by the state and federal wildlife agencies: **1)** Active California gnatcatcher and least Bell's vireo territories within 500 feet of construction limits shall be identified no less than one month prior to construction activities and		X	X	X	EGS-B			EGS-EC

Issue	Mitigation Measure	Timing				Responsible Party	Completed		Coordination/ Oversight
		Plans & Specs	Pre Const Grading	During Const	Post Const		Initials	Date	
	monitoring will continue thereafter through the nesting season or cessation of construction activities, **2)** Territories shall be monitored at weekly intervals with a focus on identifying active nests. Any atypical territory displacement, evacuation, or nest failures as compared to a control site or other baseline will be attributed to the construction project and mitigated, **3)** Subject to review of data and concurrence by the wildlife agencies, a zone of influence shall be delineated using territory mapping and nesting data and acres of indirect impact shall be assessed, and mitigated at a ratio of 0.5:1 within the JWA NCCP conservation easement area.								
O	Impacts from blasting due to excessive noise, vibrations, or scattering of blast debris shall be minimized by adjusting blasting test outside the breeding season and adjusting blasting techniques to keep noise, vibration, and blast debris at a minimum		X	X	X	SWA-CM CCM			EGS-EC EGS-B
P	If nesting season blasting is unavoidable, the project biologist shall monitor blasting test and subsequent blasting activities to determine whether impacts result (see "N" above)		X	X	X	EGS-B			EGS-EC
	Permanent Indirect Impacts								
Q	An assessment of ambient noise generated from new treatment plant facilities (e.g., pumps, motors, etc.) shall be conducted to determine if new noise levels will exceed 60 dBA L_{eq} in the adjacent habitat for the California gnatcatcher and least Bell's vireo. If new ambient noise exceeds 60 dBA L_{eq}, noise reduction features shall be implemented to reduce noise below this threshold		X	X	X	SWA-PE			EGS-EC
R	If increased ambient noise levels are unavoidable, a zone of permanent indirect impacts shall be calculated and an acceptable mitigation ratio shall be negotiated with the wildlife agencies. Mitigation shall be provided through habitat preservation in the future JWA NCCP conservation area		X	X	X	EGS-B			EGS-EC
2.7 Historical / Archaeological									
A	Although no cultural resources are anticipated within the construction footprint, if cultural resources are found during construction, work in that area should be temporarily halted, and the find assessed by a qualified archaeologist. If the find is determined to be eligible for the California Register, then a research design and data recovery program			X		CCM			EGS-EC

Issue	Mitigation Measure	Timing				Responsible Party	Completed		Coordination/ Oversight
		Plans & Specs	Pre Const Grading	During Const	Post Const		Initials	Date	
	should be prepared and carried out to mitigate impacts before ground-disturbing construction activities resume								
2.8 Geology / Soils									
A	Site Preparation. The project area shall be cleared and grubbed prior to grading. Clearing and grubbing shall consist of the removal of vegetation, asphaltic concrete, and other deleterious materials. Clearing and grubbing shall extend outside of the proposed excavation areas. The debris generated during clearing and grubbing shall be removed from areas to be graded and disposed of at a predetermined and legal location	X	X			SWA-CCM			EGS-EC
B	Temporary Excavations and Shoring. Trenches and excavations shall be designed and constructed in accordance with appropriate and applicable Occupational Safety and Health Administration (OSHA) regulations					SWA-PE			SWA-SC
2.9 Hazards/ Hazardous Materials									
A	Prepare CalOSHA "safe construction practices" plan: • Install barricades around trenches, especially during construction of open trenches too large to cover with trench plates • Plans and specifications for proper staging areas, clearly identifying vehicular and pedestrian access routes • Installation of proper signage, cones, fences, and barricades around construction sites, especially during non-construction working hours	X	X	X		SWA-CM			SWA-SC
B	Ingress and egress of construction equipment and trucks to and from the project site would be restricted to a designated haul route and construction times	X	X	X		SWA-CM CCM			EGS-SC
C	References to the potential to encounter contaminated soils and contingency plan shall be included in construction specifications and described in pre-construction meetings		X	X		SWA-CM			
D	**Contingency plan** shall be prepared to address the possibility of encountering localized areas of hazardous materials. Plan shall address community and worker health and safety, ,monitoring of excavated soil, and protocol for soil handling, stockpiling, characterization, on-site reuse, export, and disposal	X	X	X		SWA-CM CCM			SWA-SC

Issue	Mitigation Measure	Timing				Responsible Party	Completed		Coordination/ Oversight
		Plans & Specs	Pre Const Grading	During Const	Post Const		Initials	Date	
E	Contingency plan shall be implemented as required		x	x		CCM			SWA-CM
F	Sweetwater Authority shall prepare an updated Operating Procedures Plan to reflect the tasks to be performed for the upgraded water treatment facilities and shall further update the Operating Procedures Plan each time that new treatment facilities are installed. The procedures shall outline the data that should be recorded, the safety precautions taken, and the training provided for each operating procedure. The procedures would include delivery, tank change, start-up and shutdown, emergency shutdown and operations, startup following an emergency shutdown, normal operations, and temporary operations				X	SWA-SC			SWA-WQ

Biological Technical Report

for the Robert A. Perdue Water Treatment Plant Master Plan

Biological Resource Technical Report for the Robert A. Perdue Water Treatment Plant and Sweetwater Reservoir Dam Master Plan

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Final
July 11, 2005

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Attachments

1: Quino Checkerspot Butterfly Survey Report. Reising Enterprises. August 5, 2004
2: Rare Plant Survey Report. McMillan Biological Consulting. January 7, 2005
3: Updated Rare Plant Survey Report. McMillan Biological Consulting. June 30, 2005

Summary

Biological resource surveys were conducted for the Sweetwater Reservoir Master Plan in 2004 and 2005 by Sweetwater Authority staff, McMillan Biological Consulting, and Reising Enterprises. One federally listed bird species, the California gnatcatcher (*Polioptila californica californica*) was found to occur in relatively high density on-site. Three other state and federally listed species, the bald eagle (*Haliaeetus leucocephalus*), California brown pelican (*Pelecanus occidentalis californicus*), and least Bell's vireo (*Vireo bellii pusillus*), were found on-site. Focused surveys for the Quino checkerspot butterfly (*Euphydryas editha quino*) did not reveal presence of this species, and habitat suitability is considered to be low. No state or federally listed plant species were found. Many other non-listed sensitive wildlife and plant taxa were observed and/or have the potential to occur.

Construction designs for projects covered by the Master Plan have not been finalized. As such, biological impacts could not be specifically determined. When designs become available, a comparative analysis with the resources identified in this report will need to be performed. Project impacts, including any "take" of state or federally listed species, are intended to be authorized through the pending Joint Water Agency Natural Community Conservation Program (JWA NCCP). Commensurate habitat replacement at an approved ratio will be necessary for any impacts to natural vegetation communities occurring on-site, including coastal sage scrub, riparian woodland/scrub, and eucalyptus woodland. Replacement of identified disturbed or ruderal vegetation communities will also be required due to its identified value to wildlife on-site. Several other avoidance, minimization, and mitigation measures are offered that will aid in project permitting as well as reduce the significance of any project related impacts.

I. Introduction

Biological resource surveys were performed for the Robert A. Perdue Water Treatment Plant Upgrade and Sweetwater Reservoir Dam Master Plan in the County of San Diego, California (**Figure 1**). The Master Plan is intended to provide environmental review and regulatory approval for anticipated upgrades for both the existing Perdue Water Treatment Plant and Sweetwater Reservoir Dam, hereafter referred to as the Treatment Plant and Dam, respectively (**Figure 2**). The Treatment Plant upgrades are necessary to meet the Federal Safe Drinking Water Act (SDWA) as amended in 1996. Specifically, the following two rules are proposed that necessitate upgrades and improvements to the existing water Treatment Plant, (1) Disinfectant and Disinfection Byproduct proposed rule (Stage 2 DBPR) (*Federal Register* 2003), and (2) the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) (CFR 40 *Federal Register*). Similarly, modifications to the Dam, specifically the South Spillway (Figure 2), are required to increase flow capacity as a result of new flood spillway requirements by the U.S. Army Corps of Engineers (USACE). Upgrades and improvements are still in the design phase. However, the construction footprint will not exceed the study area limits shown on Figure 2. This report provides the results of the biological surveys by which future project designs can be compared to assess project impacts, as well as avoid or minimize impacts where feasible. As project designs have not

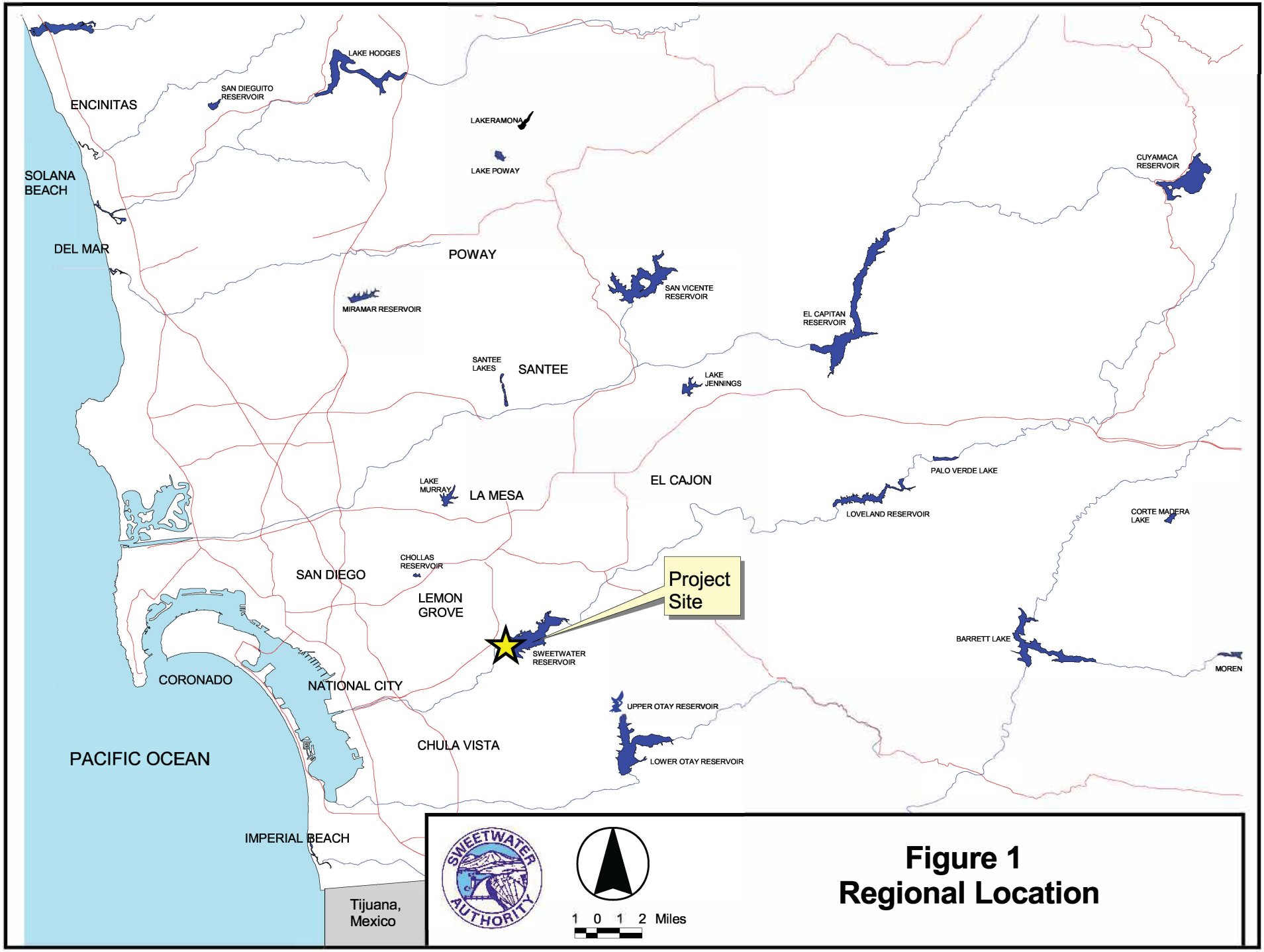

Figure 1
Regional Location

Figure 2
Master Plan Site

been finalized, the survey area boundary was selected to be larger than anticipated for project construction. The resource assessment will already be available and utilized in an alternatives analysis once project designs near completion.

II. Site Description and Physiography

The 69.4-acre Master Plan site is located at the western limits of the Sweetwater Reservoir in southwestern San Diego County. Other than the Sweetwater Reservoir itself, notable landmarks in the near vicinity include the Bonita Golf Course, the Spring Valley Swap Meet, and State Routes 54 and 125 (under construction) (Figure 2). The vast majority of this site is within the ownership and management of the Sweetwater Authority. The Master Plan area includes a small area of County Park land along the southwestern perimeter.

The Dam is inclusive within the site boundaries. Originally built in 1888, the Dam is 127 feet high, approximately 700 feet wide, and situated within the historic footprint of the Sweetwater River. The Sweetwater River terminates approximately 3 miles northwest of the Dam into San Diego Bay. A major tributary, Spring Valley Creek, adjoins the Sweetwater River 1,400 feet downstream of the Dam (Figure 2).

A substantial portion (38 %) of the Master Plan area is occupied by the existing Robert A. Perdue Water Treatment Plant and associated facilities. The Sweetwater Reservoir, up to the maximum 239' storage level, occupies 22 % of the site. The remaining 40% exists as natural vegetation communities.

The site is bordered to the north by residential housing. All other boundaries are undeveloped, including natural lands surrounding the reservoir, public open space within the Sweetwater Regional Park, and the reservoir itself. The areas are jointly contiguous with the San Diego National Wildlife Refuge, located approximately 1 mile to the southeast.

Site topography varies from flat to gentle slopes in the northern portion of the site with larger areas of moderately steep to very steep terrain closer to the reservoir and Dam. Development of the existing Treatment Plant and associated facilities has created level pads or benches necessary for facility construction. Site elevations range from approximately 340 feet above mean sea level (MSL), in the northern portion of the site, to approximately 120 feet above MSL within the Sweetwater River below the Dam.

Natural soils on-site are mapped as San Miguel rocky silt loam, Olivenhain cobbly loam, and riverwash (U.S. Department of Agriculture [USDA] 1973). The San Miguel soil series dominates the site. It is derived from metavolcanic rock and contains a clay subsoil. The USDA (1973) indicates that Escondido, Exchequer, and Friant soil series may also be inclusive with the area mapped as the San Miguel series. Olivenhain soil occurs in the northeastern portion of the site. This well drained cobbly loam soil developed from old gravelly and cobbly alluvium and contains a very cobbly clay subsoil (USDA 1973). Inclusive with this soil type are areas of Huerhuero, Diablo, and Linne soils. Riverwash soil, typically sand, gravel, and cobble, occurs within the path of the Sweetwater River downstream of the Dam.

The climate at the site is typical for areas of the San Diego County coastal plain. The average high and low temperatures recorded from the Sweetwater Reservoir weather station are 74.7 degrees and 53.4 degrees Fahrenheit (F), respectively (n=16,256). Average rainfall is calculated at 11.77 inches per year (range 4.06 to 23.93 inches) (n=45). For the 2003-2004 and 2004-2005 rainfall years, 8.51 inches and 23.51 inches of rainfall were received at Sweetwater Reservoir, respectively (D. Thomson, Director of Water Quality, unpublished data).

III. Survey Methods and Limitations

Biological resources surveys were conducted between February and September 2004 and March through June 2005. Surveys were performed by Peter Famolaro (Sweetwater Authority), Scott and Brenda McMillan (McMillan Biological Consulting), and Lara Reising (Reising Enterprises). A summary of survey dates, survey type, and personnel is provided as **Table 1**. Peter Famolaro acted as the principal biologist and was responsible for general compiling flora and fauna inventories as well as focused surveys for the California gnatcatcher (*Polioptila californica californica*) and least Bell's vireo (*Vireo bellii pusillus*) (U.S. Fish and Wildlife Service [USFWS] recovery permit number TE813431-3, California Department of Fish and Game [CDFG] Memorandum of Understanding 2002). Scott and Brenda McMillan performed rare plant searches, and Lara Reising (USFWS Recovery Permit Number TE039161-1) conducted surveys for the Quino checkerspot butterfly (*Euphydryas editha quino*). Mapping of vegetation communities was performed by Peter Famolaro in collaboration with Scott McMillan. All four biologists contributed to the comprehensive species inventory provided in this report.

Surveys for both the California gnatcatcher and Quino checkerspot butterfly were performed in 2004 in accordance with the respective USFWS survey protocols for these species (USFWS 1997 and 2002a). Surveys for the California gnatcatcher involved coverage of all potential habitat three times at a minimum of weekly intervals. Surveys for the Quino checkerspot butterfly required both an initial habitat assessment and seven passes through all identified potential habitat (see **Attachment 1**). Surveys for the least Bell's vireo were reduced from the federal least Bell's vireo survey guidelines (USFWS 2001) which recommend eight surveys during a single breeding season. For the Master Plan project, only three surveys per breeding season were performed in both 2004 and 2005 due to several years of prior information for potential least Bell's vireo habitat immediately downstream of the Sweetwater Reservoir Dam. The level of effort is also consistent with other long-term least Bell's vireo population monitoring studies conducted for the upper Sweetwater Reservoir.

Nine rare plant surveys were performed in 2004 and an additional eight surveys were performed in 2005 (**Attachments 2 and 3**). Rare plant surveys were distributed throughout each spring in an attempt to locate potentially occurring species with varying phenological events. The location of suitable soil conditions (e.g. clay lens) was emphasized in performing these surveys, since these soils have higher probability for more sensitive plant taxa.

Table 1: Survey Dates, Type, and Personnel

Date	Survey Type	Personnel
February 15, 2004	Rare plant survey	Scott McMillan
March 1, 2004	Quino checkerspot butterfly habitat assessment	Lara Reising
March 4, 2004	Rare plant survey	Scott McMillan
March 8, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
March 9, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
March 9, 2004	General biological inventory and California gnatcatcher survey	Peter Famolaro
March 10, 2004	General biological inventory and California gnatcatcher survey	Peter Famolaro
March 15, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
March 16, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
March 16, 2004	General biological inventory and California gnatcatcher survey	Peter Famolaro
March 17, 2004	General biological inventory and California gnatcatcher survey	Peter Famolaro
March 18, 2004	Rare plant survey	Scott McMillan
March 19, 2004	Rare plant survey	Scott McMillan
March 22, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
March 23, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
March 23, 2004	General biological inventory and California gnatcatcher survey	Peter Famolaro
March 24, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
March 24, 2004	General biological inventory and California gnatcatcher survey	Peter Famolaro
March 25, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
March 30, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
April 5, 2004	Rare plant survey	Scott McMillan
April 6, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
April 7, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
April 12, 2004	Rare plant survey	Scott McMillan
April 13, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
April 19, 2004	Quino checkerspot butterfly protocol survey	Lara Reising
April 22, 2004	Least Bell's vireo survey	Peter Famolaro
May 7, 2004	Least Bell's vireo survey	Peter Famolaro
May 8, 2004	Rare plant survey	Scott McMillan
May 25, 2004	Rare plant survey	Scott McMillan
June 14, 2004	Least Bell's vireo survey	Peter Famolaro
September 21, 2004	Vegetation mapping	Peter Famolaro
September 22, 2004	Vegetation mapping	Peter Famolaro Scott McMillan
March 2, 2005	Rare plant survey	Brenda McMillan
March 9, 2005	Rare plant survey	Brenda McMillan
March 31, 2005	Rare plant survey	Brenda McMillan
April 6, 2005	Least Bell's vireo survey (upland habitat)	Peter Famolaro
April 7, 2005	Rare plant survey	Brenda McMillan
April 13, 2005	Rare plant survey	Brenda McMillan
April 14, 2005	Least Bell's vireo survey (Sweetwater River)	Peter Famolaro
April 20, 2005	Rare plant survey	Brenda McMillan
April 20, 2005	Least Bell's vireo survey (upland habitat)	Peter Famolaro
May 11, 2005	Least Bell's vireo survey (Sweetwater River)	Peter Famolaro
May 20, 2005	Least Bell's vireo survey (upland habitat)	Peter Famolaro
June 7, 2005	Rare plant survey	Brenda McMillan
June 12, 2005	Rare plant survey	Brenda McMillan
June 15, 2005	Least Bell's vireo survey (Sweetwater River)	Peter Famolaro

All surveys were performed on foot and under generally favorable weather conditions. With the exception of Quino checkerspot butterfly surveys (Attachment 1), wildlife surveys were conducted in the morning hours between 0700 and 1200. Surveys avoided periods of severe heat, cold, wind, or rain that could limit species detection. All plant and animal species directly observed or indirectly detected were documented. Animal species were either observed directly with the aid of 10X42 binoculars or indirectly detected from call, song, tracks, scat, nests, or other sign. Judgments about potentially occurring flora and fauna at the site were based primarily on the known range and habitat requirements. Where available, recent biological technical reports for other projects in the vicinity of the Master Plan project site (e.g. State Route 125) or known personal observations and field notes outside of the project specific surveys were used to augment species occurrence information. The majority of plant species identifications were made in the field, although some plant specimens were collected for positive identification. Biological resources were mapped in the field on aerial photographs and topographic maps and later plotted digitally using Geographic Information Systems (GIS) software.

Limitations to the compilation of a comprehensive botanical list were imposed by seasonal factors, since some late blooming annuals may not have been identifiable at the time of the surveys. Similarly, fall and winter migratory bird species that may occur on the property would not have been present during the surveys. No nocturnal surveys or trapping was performed, which precluded detection of small rodents and bats and some herpetofauna. A wetland delineation was not performed as part of these surveys. However, an assessment of potential waters and/or wetlands that may occur under state and/or federal jurisdiction was conducted concurrent with the aforementioned biological surveys.

IV. Results

A. Botanical Resources and Vegetation Communities

One hundred ninety-two (192) plant species were detected within the survey area (**Table 2**). One hundred seventeen (117) or 61% are species native to vegetation communities of southern California. The remainder (75 or 39%) are not native to the area and have been either introduced, escaped, or naturalized from exotic origins.

Coastal sage scrub (20.8 acres) is the predominant vegetation community in the survey area. Sizable patches are found to the north and west of the existing Treatment Plant, as well as on the south side of the Dam (**Figure 3**). Coastal sage scrub habitat along the southern and western limits of the survey boundary is immediately contiguous with much larger expanses of this habitat type. Dominant species include California sagebrush (*Artemisia californica*), San Diego County viguiera (*Viguiera laciniata*), broom baccharis (*Baccharis sarothothroides*), bush monkey-flower (*Mimulus* aurantiacus), and laurel sumac (*Malosma laurina*). Lemonadeberry (*Rhus integrifolia*) and jojoba (*Simmondisa chinensis*) occur in large, dense concentrations on the steep north facing slopes that are south of the Sweetwater River. Certain areas of this mapped habitat type, primarily in the north and eastern portions of the survey area, show evidence of previous disturbance from many years prior. Vegetation has mostly recovered or is in process, and these areas are still characterized as

Table 2: Plant Species Identified

Scientific Name	Common Name(s)
LYCOPODS	
SELAGINALLACEAE	**SPIKE-MOSS FAMILY**
Selaginella bigelovii	Bigelow clubmoss
Selaginella cinerascens	Mesa mossfern, ashy spike-moss
FERNS	
PTERIDACEAE	**BRAKE FAMILY**
Adiantum jordanii	California maiden-hair fern
Pellea andromedifolia	Coffee fern
Pentagramma triangularis ssp. *triangularis*	Goldenback fern
Pentagramma triangularis ssp. *viscosa*	Silverback fern
Cheilanthes newberryi	Cotton fern
POLYPODIACEAE	**POLYPODY FAMILY**
Polypodium californicum	*California polypody*
ANGIOSPERMS: DICOTS	
AIZOACEAE	**FIG-MARIGOLD FAMILY**
**Carpobrotus* ssp.	Ice plant
**Drosanthemum hispidum*	Rosea iceplant
**Lampranthus* sp.	Iceplant
**Mesembryanthemum crystallinum*	Crystalline iceplant
**Mesembryanthemum nordiflorum*	Slender-leaved iceplant
ANACARDIACEAE	**SUMAC or CASHEW FAMILY**
Malosma laurina	Laurel sumac
Rhus integrifolia	Lemonade berry
**Schinus molle*	Peruvian pepper tree
**Schinus terebinthifolius*	Brazialian pepper tree
Toxicodendron diversilobum	Poison oak, western poison oak
APIACEAE	**CARROT FAMILY**
Apiastrum angustifolium	Mock parsely
Daucus pusillus	Rattlesnake weed
**Foeniculum vulgare*	Sweet fennel
Sanicula bipinnatifida	Purple sanicle
APOCYNACEAE	**DOGBANE FAMILY**
*Nerium oleander	Oleander
ASTERACEAE	**SUNFLOWER FAMILY**
Acourtia microcephala	Sacapellote
**Ageratina adenophora*	Sticky eupatorium
Artemisia californica	Coastal sagebrush, California sagebrush
Baccharis salicifolia	Mule fat, Seep-willow
Baccharis sarothroides	Broom baccharis
Brickellia californica	California brickellbush
**Centaurea melitensis*	Star-thistle

Table 2 (continued): Plant Species Identified

Scientific Name	Common Name(s)
**Cirsium vulgare*	Bull thistle
**Chamomilla suaveolens*	Pineapple weed, rayless chamomile
**Chrysanthemum coronarium*	Garland/Crown daisy
**Conyza canadensis*	Horseweed
Encelia californica	California encelia, common encelia
Dienandra fasciculata	Fascicled tarweed, golden tarplant
Eriophyllum confertiflorum var. confertiflorum	Golden yarrow
Gnaphalium californicum	California everlasting
Gnaphalium microcephalum	Small-flowered everlasting
Gnaphalium palustre	Cudweed, everlasting
Hazardia squarrosa var. grindeliodes	Sawtooth goldenbush
**Hedypnois cretica*	Crete hydypnois
Heterotheca grandiflora	Telegraph weed
**Hypochoeris glabra*	Smooth Cat's ear
Isocoma menziesii var. *menziesii*	Coast goldenbush
**Lactuca serriola*	Prickly lettuce
Lessingia filaginifolia var. filaginifolia	Cudweed-aster, California-aster
**Picris echioides*	Bristly ox-tongue
Rafinesquia californica	California chicory
**Senecio vulgaris*	Common grounsel
**Sonchus asper*	Spiny-leaf sow-thistle
**Sonchus oleraceus*	Common sow-thistle
Stephanomeria virgata	Virgate wreath plant
Stylocline gnaphaloides	Everlasting nest straw
**Taraxacum officinale*	Common dandelion
Uropappus lindleyi	Silver puffs
Viguiera laciniata	San Diego sunflower
**Xanthium* sp.	Cocklebur
BORAGINACEAE	**BORAGE FAMILY**
Amsinckia menziesii var. *intermedia*	Rancher's fireweed, fiddleneck
Cryptantha sp.	Cryptantha
Heliotropium curassavicum	Chinese pusley, salt heliotrope
Pectocarya lineraris ssp. *ferocula*	Slender pectocarya
Plagiobothrys sp.	Popcorn flower
BRASSICACEAE	**MUSTARD FAMILY**
**Brassica nigra*	Black mustard
**Brassica rapa*	Field mustard
Descurainia pinnata	Tansy-mustard
**Hirschfeldia incana*	Perennial mustard
Lepidium nitidum	Peppergrass
**Lobularia maritima*	Sweet alyssum
**Raphanus sativus*	Radish
CACTACEAE	**CACTUS FAMILY**
Ferocactus viridescens	Coast barrel cactus
Mammillaria dioica	Fish-hook cactus
Opuntia littoralis	Coastal prickly pear, shore cactus
Opuntia prolifera	Cholla
CAPRIFOLIACEAE	**HONEYSUCKLE FAMILY**
Lonicera subspicata	Wild honeysuckle
Sambucus mexicana	Mexican elderberry, blue elderberry

Table 2 (continued): Plant Species Identified

Scientific Name	Common Name(s)
CARYOPHYLLACEAE	**PINK FAMILY**
**Cerastium glomeratum*	Mouse-eared chickweed
**Silene gallica*	Windmill pink
**Spergularia bocconii*	Sand-spurrey
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
**Atriplex semibaccata*	Australian saltbush
**Chenopodium album*	Lamb's quarters, pigweed
**Chenopodium murale*	Pigweed, goosefoot
**Salsola tragus*	Russian thistle, tumbleweed
CONVOLVULACEAE	**MORNING-GLORY FAMILY**
Calystegia macrostegia	Morning-glory
CRASSULACEAE	**STONECROP FAMILY**
Crassula connata	Pygmy weed
Dudleya edulis	Ladies fingers
Dudleya pulverulenta ssp. pulverulenta	Chalk-lettuce
CUCURBUTACEAE	**GUORD FAMILY**
Marah macrocarpus	Wild cucumber
EUPHORBIACEAE	**SPURGE FAMILY**
Eremocarpus setigerus	Turkey-mullein, dove weed
**Ricinus communis*	Castor bean
FABACEAE	**LEGUME FAMILY**
**Acacia sp.*	Acacia
**Cassia* sp.	Cassia
Lathyrus vestitus var. *alefeldii*	San Diego sweet pea
Lotus sp.	Annual lotus
Lotus scoparius ssp. *scoparius*	California broom,deerweed
Lupinus bicolor	Dove lupine
Lupinus succulentus	Arroyo lupine
**Medicago polymorpha*	Burclover
**Melilotus officinalis*	Yellow sweetclover
*Species unknown	Vine, legume
FAGACEAE	**OAK FAMILY**
Quercus berberidifolia	Scrub oak
GENTIANACEAE	**GENTAIN FAMILY**
Centaurium venustum	Canchalagua
GERANIACEAE	**GERANIUM FAMILY**
**Erodium botrys*	
**Erodium cicutarium*	White-stemmed filaree
**Erodium moschatum*	
GROSSULARIACEAE	**GOOSEBERRY FAMILY**
Ribes indecorum	White flowering currant

Table 2 (continued): Plant Species Identified

Scientific Name	Common Name(s)
HYDROPHYLLACEAE	**WATERLEAF FAMILY**
Phacelia cicutaria ssp. *hispida*	Caterpilla phacelia
Phacelia parryi	Parry's phacelia
Pholistoma racemosum	Fiesta flower
LAMIACEAE	**MINT FAMILY**
**Marrubium vulgare*	Horehound
Salvia apiana	White sage
Salvia mellifera	Black sage
Salvia apiana x *S. mellifera*	Sage hybrid
MALVACEAE	**MALLOW FAMILY**
Malacothamnus fasciculatus	Chaparral mallow
**Malva parviflora*	Cheeseweed, little mallow
Sidalcea malvaeflora ssp. *sparsifolia*	Checker mallow, checkerbloom
MORACEAE	**MULBERRY FAMILY**
Ficus sp.	Fig
MYOPORACEAE	**MYOPORUM FAMILY**
**Myoporum laetum*	Myoporum, Ngaio
MYRTACEAE	**WAX MYRTLE FAMILY**
**Eucalyptus sp.*	Eucaplyptus
NYCTAGINACEAE	**FOUR O'CLOCK FAMILY**
Mirabilis californica	Wishbone bush
OLEACEAE	**OLIVE FAMILY**
**Olea europaea*	Olive tree
OXALIDACEAE	**OXALIS FAMILY**
**Oxalis pes-caprae*	Bermuda buttercup
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia californica	California poppy
PLANTAGINACEAE	**PLANTAIN FAMILY**
Plantago erecta	Dot seed plantain
PLATANACEAE	**PLANE TREE, SYCAMORE FAMILY**
Platanus racemosa	Western sycamore
PLUMBAGINACEAE	**LEADWORT FAMILY**
**Limonium* sp.	Cultivated sea lavender
POLEMONIACEAE	**PHLOX FAMILY**
Gilia angelensis	Grassland gilia
Linanthus dianthiflorus spp. *dianthiflorus*	Ground pink
Navarretia hamata	Hooked navarretia
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum fasciculatum var. fasciculatum	California buckwheat
Eriogonum fasciculatum var. foliolosum	Interior flat-top buckwheat

Table 2 (continued): Plant Species Identified

Scientific Name	Common Name(s)
Pterostegia drymarioides	Granny's hairnet
**Rumex* sp.	Dock
**Rumex crispus*	Curley dock
PORTULACACEAE	**PURSELANE FAMILY**
Claytonia perfoliata	Miner's lettuce
PRIMULACEAE	**PRIMROSE FAMILY**
**Anagallis arvensis*	Scarlet pimpernel
Dodecatheon clevelandii ssp. *clevelandii*	Shooting star
RANUNCULACEAE	**BUTTERCUP FAMILY**
Clematis pauciflora	Small leaf virgin's bower
Delphinium parryi	Parry's larkspur
Thalictrum fendleri var. *polycarpum*	Many fruit meadow-rue
RHAMNACEAE	**BUCKTHORN FAMILY**
Adolphia californica	California adolphia, spineshrub
Rhamnus crocea	Buckthorn, redberry, spiny redberry
ROSACEAE	**ROSE FAMILY**
Heteromeles arbutifolia	Toyon, Christmas berry
RUBIACEAE	**MADDER FAMILY**
Galium angustifolium ssp. *angustifolium*	Narrow-leafed bedstraw
**Galium aparine*	Common bedstraw
SALICACEAE	**WILLOW FAMILY**
Salix gooddingii	Goodding's black willow
Salix laevigata	Red willow
Salix lasiolepis	Arroyo willow
SAXIFRAGACEAE	**SAXIFRAGE FAMILY**
Jepsonia parryi	Coast jepsonia
SCROPHULARIACEAE	**FIGWORT FAMILY**
Antirrhinum nuttalianum	Nuttall's snapdragon
Collinsia heterophylla	Downy-leaf Chinese houses
Mimulus aurantiacus	Bush monkey-flower
Scrophularia californica ssp. *floribunda*	California figwort
SIMMONDSIACEAE	**JOJOBA FAMILY**
Simmondsia chinensis	Jojoba
SOLANACEAE	**NIGHTSHADE FAMILY**
**Nicotiana glauca*	Tree tobacco
**Solanum nigrum*	Black nightshade
TAMARICACEAE	**TAMARISK FAMILY**
**Tamarix sp.*	Tamarisk
URTICACEAE	**NETTLE FAMILY**
Urtica dioca ssp. holosericea	Hoary nettle
**Urtica urens*	Dwarf nettle

Table 2 (continued): Plant Species Identified

Scientific Name	Common Name(s)
ANGIOSPERMS: MONOCOTS	
AGAVACEAE	**AGAVE FAMILY**
Yucca whipplei	Our Lord's candle
ALLIACEAE	**ONION FAMILY**
Allium haematochiton	Red-skin onion
Allium praecox	Early onion
Dichelostemma capitatum	Blue dicks
ARECACEAE	**PALM FAMILY**
**Phoenix canariensis*	Canary Island date palm
**Washingtonia robusta*	Fan palm
CYPERACEAE	**SEDGE FAMILY**
Cyperus ssp.	Nutsedge, umbrella sedge
Scirpus californicus	Califonia bulrush
HYACINTHACEAE	**HYACINTH FAMILY**
Chlorogalum parviflorum	Soap plant, amole
JUNCACEAE	**RUSH FAMILY**
Juncus bufonius	Toad rush
LILIACEAE	**LILY FAMILY**
Calochortus splendens	Splendid Mariposa lily
MELANTHIACEAE	**BUNCH FLOWER or CAMAS FAMILY**
Zygadenus freemontii	Star lily, death camas
POACEAE	**GRASS FAMILY**
**Arundo donax*	Giant reed
**Avena sp.*	Wild oat
Bothriochloa barbinodis	Cane bluestem
Bromus carinatus var. *carinatus*	California brome
**Bromus diandrus*	Ripgut grass
**Bromus hordaceus*	Smooth brome
**Bromus madritensis ssp. rubens*	Foxtail chess
**Ehrharta calycina*	Veldt grass
Eragrostis sp.	Love grass
**Hordeum murinum*	Wild barley
**Lamarkia aurea*	Goldentop
**Lolium perenne*	Perennial rye grass
Melica imperfecta	Coast range melic, oniongrass
Muhlenbergia microsperma	Littleseed muhly
Nassella pulchra	Needlegrass
**Pennisetum setaceum*	African fountain grass
**Phalaris canariensis*	Canary grass
**Polypogon monspeliensis*	Annual beard grass
**Schismus barbatus*	Mediterranean schismus
**Vulpia myuros*	Foxtail fescue

Table 2 (continued): Plant Species Identified

Scientific Name	Common Name(s)
TYPHACEAE	**CATTAIL FAMILY**
Typha sp.	Cattail

*** Denotes non-native or exotic species**

Data sources

P. Famolaro, Sweetwater Authority
B. McMillan, McMillan Biological Consulting
S. McMillan, McMillan Biological Consulting
L. Reising, Reising Enterprises

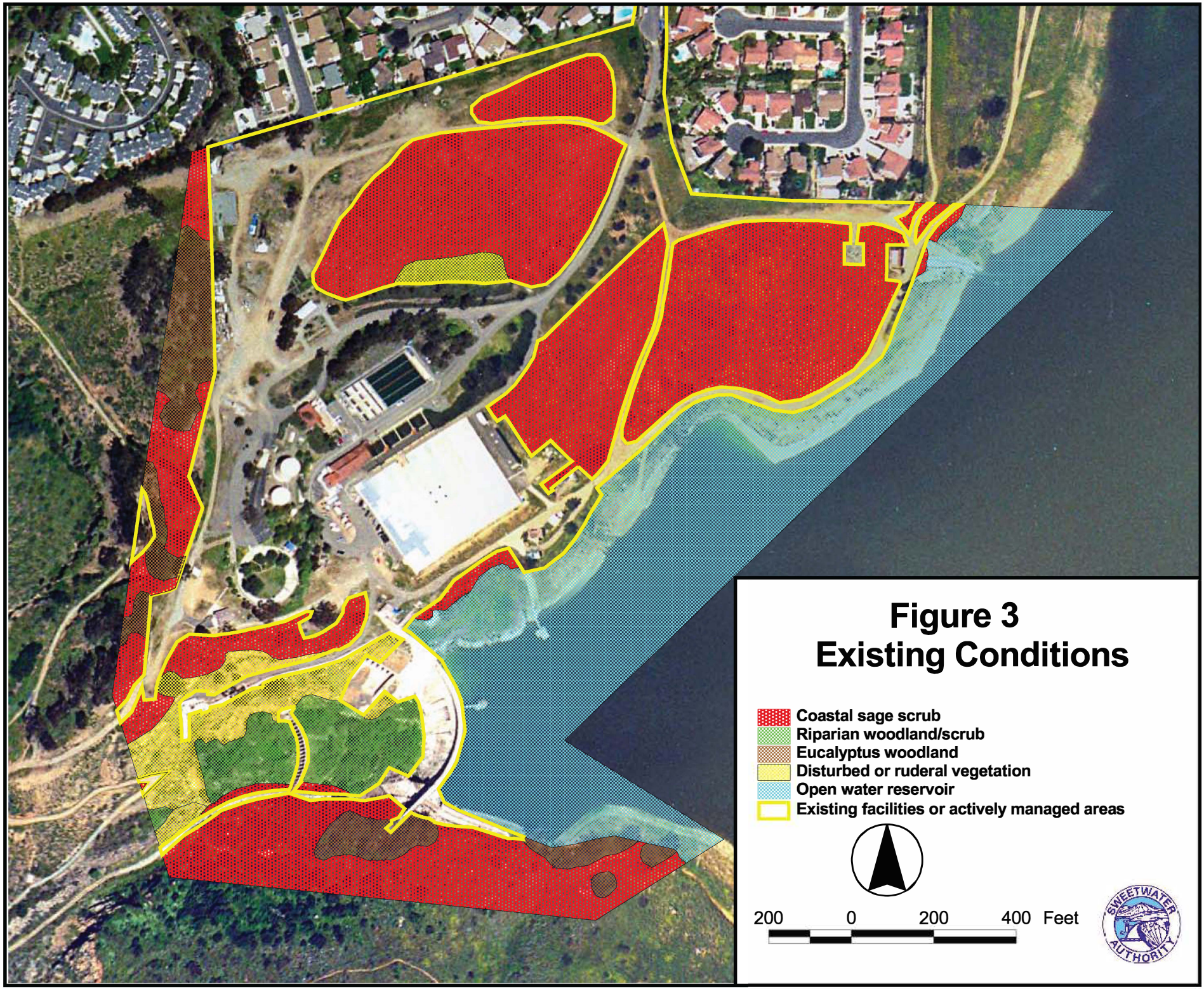
Figure 3
Existing Conditions
Coastal sage scrub
Riparian woodland/scrub
Eucalyptus woodland
Disturbed or ruderal vegetation
Open water reservoir
Existing facilities or actively managed areas
200
0
200
400
Feet
SWEETWATER AUTHORITY

coastal sage scrub. In addition, several non-native trees, including eucalyptus (*Eucalyptus* sp.) and Peruvian pepper tree (*Schinus molle*) are contained within this mapping unit. These trees occur as isolated individuals and are not substantial enough or in near proximity to denser concentrations of similar species to warrant segregation from this mapping unit. Open clay soils or clay lens habitat occur within this coastal sage scrub mapping unit. These areas are generally void of shrub cover and are characterized by a mixture of native and non-native grasses and forbs, including California brome (*Bromus carinatus*), foxtail chess (*Bromus madritensis* ssp. *rubens*), needlegrass (*Nassella pulchra*), wild oats (*Avena* sp.), mustards (*Brassica* sp.), fascicled tarweed (*Deinandra fasciculata*), blue dicks (*Dichlostemma capitatum*), and soap plant (*Chlorogalum parviflorum*).

Riparian woodland/scrub (2.1 acres) is found within the Sweetwater River immediately downstream of the Dam (Figure 3). Segmented by a large concrete wier, commonly referred to as the stilling pool dam, this riparian area occurs within the historic construction area of the Dam and shows obvious signs of prior disturbance, both physically and vegetatively. Exposed pipe encasements, a pathway, and scoured rock occur among a mixture of black and arroyo willow (*Salix gooddingii* and *Salix lasiolepis*), western sycamore (*Platanus racemosa*), cattail (T*ypha sp.*) and mule fat (*Baccharis salicifolia*). Sticky eupatorium (*Ageratina adenophora*), fig trees (*Ficus sp.*), and other exotic species also punctuate the area's disturbed condition.

Eucalyptus woodland (2.5 acres) occurs in concentrated patches along the western and southern portions of the survey area (Figure 3). Most of these trees are mature, having been planted or escaped many years earlier. No attempt to speciate these trees were made. However, personal communication with Bill Barsch (Sweetwater Authority Water Quality Maintenance Superintendent) has revealed that both sugar gum (*Eucalpytus cladocalyx*) and spotted gum (*E. maculata*) occur on-site. Other species may be present as well. While understory vegetation is limited mostly to non-native grasses and weedy species, these wooded areas also support some native shrub cover. Species include California adolphia (*Adolphia californica*), California sagebrush, and California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*).

Disturbed or ruderal vegetation (2.4 acres) is predominantly found just west of the Dam (Figure 3). This vegetation type is characterized as areas where former disturbance has occurred and natural colonization has favored ruderal or weedy species versus native plant species. Dominant species include African fountain grass (*Pennisetum setaceum*) and black mustard (*Brassica nigra*). A few individual laurel sumac, broom baccharis, and California buckwheat also occur, but typically as isolated individuals. Disturbance of these areas probably dates from Dam construction or subsequent improvements many years ago, and it appears that these areas have reached a climax vegetation community.

Developed areas (26.5 acres) include all existing Treatment Plant and Dam facilities, landscaping, and actively managed areas (e.g. firebreaks, stockpile, and staging areas) (Figure 3). Landscape plants, trees, shrubs, and groundcover were not surveyed as part of this biological resources inventory. Although firebreaks, stockpile, and staging areas may at times contain vegetation, these areas are routinely mowed, scraped, and/or applied with

herbicide to preclude further vegetation establishment, and as such are included within the developed mapping unit. Species observed include broom baccharis, coast goldenbush (*Isocoma menziesii*), Russian thistle (*Salsola tragus*), filaree (*Erodium sp.*), cheeseweed (*Malva parviflora*), burclover (*Medicago polymorpha*), mustard (*Brassica sp.*), and wild oats (*Avena sp.*), among others.

Open water reservoir (15.1 acres) occupies the remainder of the survey area polygon (Figure 3). Although not observed at the time of survey, this mapping unit includes all area up to reservoir high water mark (239 foot elevation contour). Vegetation, predominantly ruderal or weedy species, that establishes during low water conditions is either removed mechanically or becomes inundated by periodic water level increases. Open water reservoir extends well beyond the survey limits, occupying a total surface area of 1,030 acres at maximum capacity.

B. Wildlife Resources

Fourteen (14) butterfly, 5 reptile and amphibian, 68 bird, and 6 mammal species were identified within the survey area (**Table 3**). Species identified are considered typical to scrub, woodland, aquatic, and ruderal habitats occurring on-site. In addition to the species shown on Table 3, Sweetwater Authority has compiled data of all previous and on-going wildlife species occurrence on the Sweetwater Reservoir property and immediately adjacent lands. The comprehensive wildlife database includes 30 butterfly, 41 reptiles and amphibians, 243 bird, and 50 mammals. Many of these have been observed within the Master Plan survey area, although not detected at the time of surveys (P. Famolaro pers. obs.).

Although prior disturbance of much of shrublands has occurred, wildlife use has recovered. Residential and Treatment Plant site edge effects are considered minimal given the abundance and diversity of species occurring on-site. Observations of large mammalian species during the survey period, including mule deer (*Odocoileus hemionus*), bobcat (*Felis rufus*), and coyote (*Canis latrans*) demonstrate movement and habitat linkages that are necessary to sustain these larger vertebrate species. Most notably, the Sweetwater Reservoir itself provides a refuge for a large contingent of aquatic associated avifauna (e.g. grebes, herons, ducks, etc.). Raptors, too, are attracted to the reservoir property, either to prey on fish, as is the case for Osprey (*Pandion halietus carolinensis*), or waterfowl (e.g. Peregrine falcon [*Falco peregrinus*]). Many of the raptor species can often be found roosting in the eucalyptus trees surrounding the Dam (P. Famolaro pers. obs.).

C. Sensitive Resources

Identified or potentially occurring sensitive resources are discussed in this section. For the purposes of this report, species will be considered sensitive if they are: (1) listed by state or federal wildlife agencies as threatened or endangered or are candidates or proposed for such listing; (2) proposed for coverage in the Joint Water Agency Natural Community Conservation Program (JWA NCCP) (TAIC 2004); (3) listed on California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants; or (4) otherwise considered

Table 3: Wildlife Species Identified

Common Name	Scientific Name
Butterflies	
Anise Swallowtail	*Papilio zelicaon zelicaon*
Western Tiger Swallowtail	*Papilio rutulus rutulus*
Common white	*Pieris protodice*
Cabbage white	*Pieris rapae*
Sara orangetip	*Anthocharis sara sara*
Painted lady	*Cynthia cardui*
West coast lady	*Cynthia annabella*
Virginia lady	*Cynthia virginiensis*
Behr's metalmark	*Apodemia mormo virgulti*
Brown elfin = western elfin	*Callophrys* (=*Incisalia*) *augustinus*
Marine blue	*Leptotes marina*
Pigmy blue	*Brephidium exilis*
Southern blue	*Glaucophsyche lygdamus australis*
Funereal duskywing	*Erynnis funeralis*
Amphibians	
*Bullfrog	*Rana catesbeiana*
Reptiles	
Western fence lizard	*Sceloporus occidentalis*
Side-blotched lizard	*Uta stansburiana*
Orange-throated whiptail	*Cnemidophorus hyperythrus beldingi*
Southern pacific rattlesnake	*Crotalus viridis helleri*
Birds	
Pied-billed grebe	*Podilymbus podiceps podiceps*
Eared grebe	*Podiceps nigricollis californicus*
Clark's grebe	*Aechmophorus clarkii*
Western grebe	*Aechmophorus occidentalis*
Double-crested cormorant	*Phalacrocorax auritus albociliatus*
American white pelican	*Pelecanus erythrorhynchos*
California brown pelican	*Pelecanus occidentalis californicus*
Great blue heron	*Ardea herodias herodias*
Turkey vulture	*Cathartes aura*
Osprey	*Pandion haliaetus carolinensis*
Northern harrier	*Circus cyaneus hudsonius*
Cooper's hawk	*Accipiter cooperii*
Red-tailed hawk	*Buteo jamaicensis*
American kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
American wigeon	*Anas americana*
Gadwall	*Anas strepera strepera*
Mallard	*Anas platyrhynchos platyrhynchos*

TABLE 3 (continued): Wildlife Species Identified

Common Name	Scientific Name
Northern shoveler	*Anas clypeata*
Bufflehead	*Bucephala albeola*
Ruddy duck	*Oxyura jamaicensis rubida*
American coot	*Fulica americana americana*
Killdeer	*Charadrius vociferus vociferus*
Ring-billed gull	*Larus delawarensis*
Herring gull	*Larus argentatus smithsonianus*
Western gull	*Larus occidentalis*
Forster's tern	*Sterna forsteri*
Mourning dove	*Zenaida macroura marginella*
White-throated swift	*Aeronautes saxatalis*
Anna's hummingbird	*Calypte anna*
Belted kingfisher	*Ceryle alcyon*
Nuttall's woodpecker	*Dendrocopos nuttallii*
Northern flicker	*Colaptes auratus*
Western flycatcher	*Empidonax difficilis*
Black phoebe	*Sayornis nigricans semiatra*
Cassin's kingbird	*Tyrannus vociferans vociferans*
Western kingbird	*Tyrannus verticalis*
Tree swallow	*Tachycineta bicolor*
Northern rough-winged swallow	*Stelgidopteryx ruficollis*
Barn swallow	*Hirundo rustica erythrogaster*
Cliff swallow	*Hirundo pyrrhonota tachina*
Western scrub jay	*Aphelocoma californica*
Common raven	*Corvus corax clarionensis*
Least Bell's vireo	*Vireo bellii pusillus*
Bushtit	*Psaltriparus minimus minimus*
Bewick's wren	*Thyromanes bewickii*
House wren	*Troglodytes aedon parkmanii*
Northern mockingbird	*Mimus polyglottos polyglottos*
Wrentit	*Chamaea fasciata henshawi*
Ruby-crowned kinglet	*Regulus calendula*
California gnatcatcher	*Polioptila californica californica*
Phainopepla	*Phainopepla nitens lepida*
Lesser goldfinch	*Carduelis psaltria hesperophilus*
House finch	*Carpodacus mexicanus frontalis*
Orange-crowned warbler	*Vermivora celata*
Yellow warbler	*Dendroica petechia*
Yellow-rumped warbler	*Dendroica coronata*
Common yellowthroat	*Geothlypis trichas*
Black-headed grosbeak	*Pheucticus melanocephalus maculatus*
Blue grosbeak	*Passerina caerulea salicaria*
Spotted towhee	*Pipilo maculatus*
California towhee	*Pipilo crissalis*
Song sparrow	*Melospiza melodia*
Lincoln's sparrow	*Zonotrichia lincolnii*
White-crowned sparrow	*Zonotrichia leucophrys*
Brown-headed cowbird	*Molothrus ater*
Hooded oriole	*Icterus cucullatus nelsoni*
*European starling	*Sturnus vulgaris*

TABLE 3 (continued): Wildlife Species Identified

Common Name	**Scientific Name**
Mammals	
Desert cottontail	*Sylvilagus audubonii*
Woodrat	*Neotoma* sp.
Coyote	*Canis latrans*
Striped skunk	*Mephitis mephitis*
Bobcat	*Felis rufus*
Mule deer	*Odocoileus hemionus*

*** Denotes non-native or introduced species**

Data sources
P. Famolaro, Sweetwater Authority
B. McMillan, McMillan Biological Consulting
S. McMillan, McMillan Biological Consulting
L. Reising, Reising Enterprises

sensitive or noteworthy by local, state, or federal agencies. All native habitats occurring on-site are considered sensitive. Additionally, wetlands or identified state or federal jurisdictional waters are generally considered sensitive.

1. Plant Communities, Habitats, or Jurisdictional Areas

Coastal sage scrub is considered a sensitive plant community to state and federal resource agencies as well as local jurisdictions and conservation organizations. It is estimated that losses of up to 85 % have occurred in Southern California due to broad scale urban/suburban and agricultural development. Most remnants of this community are either isolated or highly fragmented, which further threatens its long-term viability. Coastal sage scrub provides habitat for a variety of sensitive plant and animal species, including the federally threatened California gnatcatcher. While disturbed in some areas, coastal sage scrub within the Master Plan area is mostly recovered and of both local and regional importance. The plant community is contiguous with much larger areas on the Sweetwater Reservoir property as well as the adjacent County Park and San Diego National Wildlife Refuge. Clay soils or clay lens habitat identified within the coastal sage scrub plant community is also considered sensitive since it has the potential to support various rare and endemic plant species.

Riparian woodland and scrub has experienced significant declines in the southwest region of the United States. Losses of up to 95 % of this habitat type have been estimated due to agriculture, urbanization, flood control, lakes and reservoirs, and mineral extraction. Riparian woodland and scrub plant communities provide valuable habitat for a large diversity of wildlife, particularly the avian species. The federally and state endangered least Bell's vireo and willow flycatcher (*Empidonax traillii*) are riparian obligates who rely on these habitats for breeding purposes. Riparian plant communities are considered sensitive to state and federal resource agencies, local jurisdictions, and conservation organizations. In addition, most but not all riparian plant communities fall under the federal jurisdiction of the Clean Water Act, as described below. Riparian woodland and scrub within the Master Plan area occur immediately downstream of the Dam and show evidence of disturbance from construction of the Dam and associated facilities. These areas are further degraded by lack of sediment replacement downstream of the Dam as well as invading exotic species. Nonetheless, the riparian habitat on-site is still considered sensitive and of significant biological value given the limited amount of riparian habitats remaining in the region.

Jurisdictional waters and associated wetlands are located within the riparian area downstream of the Dam as well as the reservoir itself. Typically, USACE claims jurisdiction of navigable waters (lakes, streams, rivers, bays, etc) up to the ordinary high water mark. Wetland habitats, areas meeting all three wetland criteria (i.e. wetland hydrology, hydrophytic vegetation, and hydric soils), can be a subset of these Corps jurisdictional areas. The federal government employs a policy of "no-net-loss" of wetland habitat. The Sweetwater Reservoir would be considered USACE jurisdictional waters. The riparian zone below the Dam up to the ordinary high water mark also falls under USACE jurisdiction. A detailed wetland delineation would be necessary to determine how much of this area would be classified as wetlands. CDFG also claims jurisdiction of riparian areas under the Fish and

Game Code. CDFG jurisdiction is usually more liberally applied and includes all riparian zones up to the vegetation community perimeter or drip line.

2. Sensitive Plant Species

Rare or sensitive plant species are described in Attachment 2 and summarized in **Table 4**. Rare plant surveys performed in 2004 under low seasonal rainfall were duplicated in 2005 under a heavy rainfall season. As a result of the surveys, no state or federally listed species were detected within the Master Plan area. Four (4) sensitive plant species, ashy spike-moss (*Selaginella cinerascens*), San Diego County viguiera (*Viguiera laciniata*), coast barrel cactus (*Ferocactus viridescens*), and California adolphia (*Adolphia californica*), were detected on-site. In addition to Palmer's grappling hook (*Harpogonella palmeri*), which was identified just outside of the Master Plan boundary, 11 other sensitive plant species have the potential to occur on-site due to suitability of habitat and proximity of known populations.

Although not identified, the majority of undeveloped areas within the Master Plan project area have been designated as federal "critical habitat" for Otay tarplant (*Dienandra conjugens*) (USFWS 2002b). A critical habitat designation describes geographic boundaries that are essential to the conservation and management of a threatened or endangered species. This designation does not affect land ownership or access rights, or mandate resource protection. The designation only applies to federal agencies on any actions they take to authorize, fund, or permit activities within critical habitat areas. Other than Otay tarplant, no other plants with designated critical habitat occur within the Master Plan area.

3. Sensitive Wildlife Species

Twenty-four (24) sensitive wildlife species were detected on-site during the surveys or are known to occur. Five of these are listed as threatened or endangered by the state and/or federal resource agencies. Thirty (30) other sensitive species have the potential to occur based on known or documented species occurring in the vicinity of the Master Plan project area and/or habitat suitability. Brief descriptions of all sensitive species, occurring or potentially occurring, are provided in **Table 5**. Occurrence for species listed as threatened or endangered are described below. Despite focused surveys in 2004, no Quino checkerspot butterfly was detected within the survey area (Attachment 1).

California brown pelican (*Pelecanus occidentals californicus*). The California brown pelican is a state and federal endangered species. Usually associated with marine or salt water habitats, brown pelicans can occasionally be found on inland lakes. Populations were originally threatened by the use of the DDT, an organochlorine pesticide that caused egg shell thinning and an ultimate decline in reproduction. U.S. bans of this product have aided in the recovery of this species, although other hazards continue to threatened the species, including competition for food with the commercial fishing industry, human disturbance and development near nesting colonies, oil tanker spills, and monofilament fishing line and fishing tackle. At Sweetwater Reservoir, brown pelicans (up to approximately 50 individuals) have been observed regularly from late spring through fall (P. Famolaro pers.

Table 4: Sensitive Plant Species Observed or Potentially Occurring

Species	Status State/Fed.	CNPS Status List/Code	JWA NCCP Species	Habitats	Occurrence
Plants					
Ashy spike-moss (*Selaginella cinerascens*)	-/-	4 / 1-2-1	No	Coastal sage scrub, chaparral, and grassland with dry, exposed soils.	Ashy spike moss was found in coastal sage scrub habitat on-site. The most significant patches occurred in the eastern portion of the survey area.
San Diego ambrosia (*Ambrosia pumila*)	-/FE	1B / 3-3-2	Yes	River and floodplain terraces, open grasslands and coastal sage scrub, often disturbed sites.	San Diego ambrosia is known several miles to the east along the Sweetwater River. San Diego ambrosia is not expected within the Master Plan area. The species would have been detected during 2004 and 2005 surveys if present.
San Diego sagewort (*Artemisia palmeri*)	-/-	4 / 1-2-1	No	Riparian woodlands, drainages and mesic sites.	Not detected. San Diego sagewort is found in riparian woodland habitat in the upper limits of the Sweetwater Reservoir. The potential for occurrence within the Master Plan area is low as it would have been evident if present.
Otay tarplant (*Deinandra conjugens*)	SE/FT	1B / 3-3-2	Yes	Grassland and coastal sage scrub with heavy clay soils.	Large populations of Otay tarplant occur just east of the Master Plan area. The species was not detected during 2004 and 2005 surveys of the Master Plan area. The potential for future occurrence is considered low due to close proximity of neighboring populations.
Palmer's goldenbush (*Ericameria palmeri* ssp. *palmeri*)	-/-	2 / 3-2-1	Yes	Coastal sage scrub and chaparral, mesic sites.	Not detected. The potential for occurrence within the Master Plan area is very low as it would have been evident if present.
San Diego marsh-elder (*Iva hayesiana*)	-/-	2 / 2-2-1	No	Riparian woodland, drainages, and mesic sites.	Not detected. San Diego marsh elder is common in riparian wetlands and moist drainages in the eastern limits of the Sweetwater Reservoir property. The potential for occurrence within the Master Plan area is low as it would have been evident if present.
San Diego County viguiera (*Viguiera laciniata*)	-/-	4 / 1-2-1	No	Coastal sage scrub and chaparral.	San Diego County viguiera is a common shrub within coastal sage scrub habitat on-site, particularly on south-facing slopes.
Palmer's grappling hook (*Harpagonella palmeri*)	-/-	4 / 1-2-1	Yes	Coastal sage scrub, chaparral, grassland, associated with heavy clay soils.	Palmer's grappling hook was identified just west of Master Plan area.

Table 4 (continued): Sensitive Plant Species Observed or Potentially Occurring

Species	Status State/Fed.	CNPS Status List/Code	JWA NCCP Species	Habitats	Occurrence
Coast barrel cactus (*Ferocactus viridescens*)	-/-	2 / 1-3-1	Yes	Coastal sage scrub, maritime succulent scrub, chaparral, and grassland.	Coast barrel cacti were recorded in coastal sage scrub habitat throughout the project area. The most significant numbers were located in the northwestern and eastern portions of the survey area.
Snake cholla (O*puntia californica* var. *californica*)	-/-	1B / 3-3-2	Yes	Coastal sage scrub, maritime succulent scrub, and chaparral.	Not detected. The potential for occurrence within the Master Plan area is low as it would have been evident if present.
Small-flowered morning glory (*Convolvulus simulans*)	-/-	4 / 1-2-2	No	Coastal sage scrub, grassland, chaparral with open clay soils.	Not detected but could potentially occur within the Master Plan area. Small-flowered morning glory is found at several locations around the reservoir.
Variegated dudleya (*Dudleya variegata*)	-/-	1B / 2-2-2	Yes	Coastal sage scrub, chaparral, grasslands, and vernal pool, associated with clay soils.	Not detected but could potentially occur on-site. Variegated dudleya is known to occur on the Sweetwater Reservoir property, east of the Master Plan area.
San Diego thornmint (*Acanthomintha ilicifolia*)	SE/FT	1B / 2-3-2	Yes	Grasslands, coastal sage scrub, chaparral, and vernal pools with heavy clay soils.	Closest known population of San Diego thornmint is in Proctor Valley, a few miles to the south. San Diego thornmint is not expected within the Master Plan area. The species would have been detected during 2004 and 2005 surveys if present.
California adolphia (*Adolphia californica*)	-/-	2 / 1-3-1	No	Coastal sage scrub, chaparral, grasslands, associated with clay soils.	Patches of California adolphia were recorded along the western boundary of the Master Plan area in both coastal sage scrub and the eucalyptus woodland understory.
San Diego goldenstars (*Muilla clevelandii*)	-/-	1B / 2-3-2	Yes	Grassland, coastal sage scrub, chaparral, and vernal pools with clay soils.	Not detected but could potentially occur on-site. Large populations of the San Diego goldenstars occur to the east at the upper limits of the Sweetwater Reservoir and slightly beyond along the Sweetwater River.
Southwestern spiny rush (*Juncus acutus* ssp. *leopoldii*)	-/-	4 / 1-2-1	No	Riparian areas, mesic meadows, seeps, alkaline flats, and coastal brackish marsh.	Not detected. Southwestern spiny rush occurs at several locations on the Sweetwater Reservoir property. The potential for occurrence within the Master Plan area is low as it would have been evident if present.

Table 4 (continued): Sensitive Plant Species Observed or Potentially Occurring

Status
SE = State Endangered
FT = Federally Threatened
FE = Federally Endangered

California Native Plant Society (CNPS)
List 1A = Presumed extinct in California.
List 1B = Rare, threatened, or endangered in California and elsewhere.
List 2 = Rare, threatened, or endangered in California, but more common elsewhere.
List 3 = More information needed (review list).
List 4 = Limited distribution (watch list).

CNPS (R-E-D) Code
R (Rarity)
1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time.
2 = A limited number of occurrences in California, occasionally more if each occurrence is small.
3 = One to several highly restricted occurrences, or present in such small numbers that it is seldom reported.

E (Endangerment)
1 = Not very endangered in California.
2 = Fairly endangered in California.
3 = Seriously endangered in California.

D (Distribution)
1 = More or less widespread outside California.
2 = Rare outside California.
3 = Endemic to California.

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Table 5: Sensitive Wildlife Species Observed or Potentially Occurring

Species	Status State/Fed.	JWA NCCP Species	Habitats	Occurrence
Invertebrates				
Quino checkerspot butterfly (*Euphydryas editha quino*)	-/FE	Yes	Coastal sage scrub, vernal pools, and grasslands. Plantain (*Plantago erecta*), purple owls-clover (*Castilleja exsreta*), Coulter's snapdragon *(Antirrhinum coulterianum*), dark-tip bird's beak (*Cordylanthus rigidus*), and desert plantain (*P. patagonica*) are larval host plants.	Protocol level surveys did not detect this species. The species habitat assessment revealed that the potential for species occurrence is low due to the lack of larval host plants, disturbance, and habitat fragmentation. Habitat suitability was greater in coastal sage scrub south of the dam but the species was not detected.
Harbison's dun skipper (*Euphyes vestries harbisoni*)	-/FSC	Yes	Riparian and oak woodlands, perennial water source from seep or spring. San Diego sedge (*Carex spissa*) is larval host plant.	Not detected. The species is not expected within the Master Plan area given the lack of larval host plants on-site.
Hermes copper butterfly (*Lycaena hermes*)	-/FSC	Yes	Coastal sage scrub, chaparral. Redberry (*Rhamnus crocea*) is larval host plant.	Not detected. Redberry was detected within the Master Plan area in very low quantity (possibly as little as one shrub). The potential for species occurrence is considered low.
Amphibians				
Arroyo toad (*Bufo californicus*)	CSC/FE	Yes	Open, exposed sandy and gravelly river bottoms, floodplain terraces, coastal sage scrub, chaparral with loose sandy soils for burrowing.	Not detected. Although previously recorded in the eastern portion of Sweetwater Reservoir in 1997, the species is not expected within Master Plan area. River bottom habitat below the dam is not suitable.
Western spadefoot (*Spea hammondii*)	CSC/-	Yes	Open areas with sandy or gravelly soil, washes, floodplains, temporary ponds (road depressions), and vernal pools.	Not detected. The species is known to the east both on and beyond Sweetwater Authority property. The potential for occurrence within the Master Plan area, however, is considered low due to mostly unsuitable habitat.
Reptiles				
Western pond turtle (*Clemmys marmorata*)	CSC/-	Yes	Aquatic and riparian habitats, ponds or pools with open areas for basking. Also known to lakes and reservoirs.	Not detected. Western pond turtle is known to occur in low densities within former sand mining ponds in the upper limits of Sweetwater Reservoir. Species use within other areas of the reservoir, including the Master Plan area, is unknown but could occur given the proximity and connectivity of existing records.
Orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*)	CSC/-	Yes	Coastal sage scrub, chaparral, and grassland.	Orange-throated whiptails were recorded in coastal sage scrub within the Master Plan area.

Table 5 (continued): Sensitive Wildlife Species Observed or Potentially Occurring

Species	Status State/Fed.	JWA NCCP Species	Habitats	Occurrence
San Diego horned lizard (*Phrynosoma coronatum blainvillii*)	CSC/-	Yes	Loose sandy soils with open areas for basking, coastal sage scrub, chaparral, grassland, oak woodland, riparian woodland, and coniferous forest.	Not detected. San Diego horned lizards have been recorded in the eastern portion of the Sweetwater Reservoir property. The species could potentially occur within suitable habitat in the Master Plan area.
Coronado skink (*Eumeces skiltonlanus interparietalis*)	CSC/-	No	Coastal sage scrub, chaparral, oak woodland, riparian, and grassland habitat.	Not detected during the survey. Coronado skink, however, has previously been found within the Treatment Plant compound.
Silvery legless lizard (*Anniella pulchra pulchra*)	CSC/-	No	Loose sandy soils within beach, chaparral, or riparian habitats.	Not detected. Silvery legless lizard has been recorded in the eastern portion of the Sweetwater Reservoir property. The species could potentially occur within suitable habitat in the Master Plan area.
Two-striped garter snake (*Thamnphis hammondii*)	CSC/-	No	Perennial or seasonal streams with rocky or sandy bottom, stock ponds, and other artificial water bodies (lakes with partially submerged vegetation).	Not detected. Two-striped garter snake has been recorded within the Sweetwater River immediately east of the Sweetwater Reservoir property. The species could potentially occur within suitable habitat in the Master Plan area.
Red-diamond rattlesnake (*Crotalus ruber rubber*)	CSC/-	No	Coastal sage scrub, chaparral, grassland, and agricultural areas.	Not detected during the surveys. Red-diamond rattlesnake is known to several locations around the Sweetwater Reservoir. The species could potentially occur within suitable habitat in the Master Plan area.
Birds				
Common loon (*Gavia immer*)	CSC/-	No	Migrant and winter visitor to aquatic habitat, primarily to saltwater (bays, lagoons), but also on inland freshwater lakes.	Not detected during the surveys. Common loon has been found in the Sweetwater Reservoir in rare or infrequent occurrence. The species could utilize aquatic habitat of the reservoir within the Master Plan area.
Clark's grebe (*Aechmophorus clarkia*)	-/-	Yes	Migrant and winter visitor to aquatic habitats bays, estuaries, near coastal ocean water, as well as inland lakes. Localized breeding resident to inland lakes utilizing areas of emergent vegetation areas for nesting.	Clark's grebe was detected during the surveys within the Sweetwater Reservoir, including the Master Plan area. The species is a resident breeder to the reservoir, but nesting sites have all been recorded well east of the Dam.
Western grebe (*Aechmophorus occidentalis*)	-/-	Yes	Migrant and winter visitor to aquatic habitats bays, estuaries, near coastal ocean water, as well as inland lakes. Localized breeding resident to inland lakes utilizing areas of emergent vegetation areas for nesting.	Western grebe was detected during the surveys within the Sweetwater Reservoir, including the Master Plan area. The species is a year round resident to the reservoir with numbers increasing during the winter. Breeding occurs in the upper limits of the reservoir and secluded coves. Suitable nesting habitat does not occur in the Master Plan area.

Table 5 (continued): Sensitive Wildlife Species Observed or Potentially Occurring

Species	Status State/Fed.	JWA NCCP Species	Habitats	Occurrence
American white pelican (*Pelecarus erythrorhynchos*)	CSC/-	No	Winter visitor to both salt and freshwater habitats (bay, lagoons, estuaries, ponds, and lakes).	White pelicans were observed within the Master Plan area during the survey period. The species occurs frequently at the Sweetwater Reservoir with highest occurrence during the winter and early spring. Often found in more shallow area of the reservoir (delta and coves) foraging in large groups, they can also be found roosting on the log boom near the Dam.
California brown pelican (*Pelecanus occidentalis californicus*)	SE, CFP/FE	Yes	Summer and fall visitor (non-breeding) along coastal waters and more rarely at inland lakes.	California brown pelicans were observed on the Sweetwater Reservoir during the surveys. The species occurs regularly between late spring and early winter. It can often be found on the log boom within the Master Plan area or diving for fish in the vicinity of the Dam.
Double-crested cormorant *(Phaiacrocorax auritus*)	CSC/-	No	Visitor and localized breeding resident to most open aquatic habitats (bays, lagoons, lakes, ponds). Utilizes woodland in or near water for rookeries.	Double crested cormorants were identified during the surveys. The species utilizes all areas of the Sweetwater Reservoir but can often be found on the log boom within the Master Plan area. Breeding rookeries have been established irregularly within the upper limits of the reservoir as well as the eucalyptus woodland south of the Dam.
Osprey (*Pandion haliaetus*)	CSC/-	Yes	Visitor and localized breeding resident. Occurrence associated with aquatic, open water for foraging, woodland/snags for roosting. Nests in trees and artificial sites (e.g. constructed platforms).	Osprey was detected during the surveys with the Master Plan area. This species, one and sometimes two individuals, occur year round at Sweetwater Reservoir. Nesting has not occurred. Eucalyptus woodland just south of the Dam and the Dam intake tower are favored roosting spots.
White-tailed kite (*Elanus leucurus*)	CFP/-	No	Resident using grassland, coastal sage scrub, weedy sites, and marshes for foraging. Riparian, sycamore, and oak woodland areas for nesting.	White-tailed kites were detected during the surveys within the Master Plan area. The species is a known breeder to Sweetwater Reservoir in riparian woodland and other densely wooded areas. Eucalyptus woodland just south of the Dam has been commonly used for roosting.
Northern harrier (*Circus cyaneus*)	CSC/-	Yes	Winter visitor and localized breeding resident to grasslands, coastal sage scrub, mudflats, coastal marshes, open fields. Nests in open grasslands.	Northern harrier was observed during the surveys foraging over coastal sage scrub habitat. The species occurs regularly at Sweetwater Reservoir, utilizing most low growing vegetation types.
Sharp-shinned hawk (*Accipiter striatus velox*)	CSC/-	No	Migrant and winter visitor to grasslands, coastal sage scrub, chaparral, woodland sites (natural and urbanized).	Not detected during the surveys. However, sharp-shinned hawk has been detected irregularly between late fall and early spring on the Sweetwater Reservoir property, utilizing both scrub and wooded habitats. Suitable habitat occurs within the Master Plan area, and species occurrence is expected.

Table 5 (continued): Sensitive Wildlife Species Observed or Potentially Occurring

Species	Status State/Fed.	JWA NCCP Species	Habitats	Occurrence
Cooper's hawk (*Accipiter cooperii*)	CSC/-	Yes	Resident using a variety of habitats (coastal sage scrub, chaparral, oak woodlands, grasslands, urban sites) for foraging. Wooded sites are used for nesting.	Copper's hawk was observed during the surveys. In previous years, the species has nested in eucalyptus woodland within the Treatment Plant compound.
Bald eagle (*Haliaeetus leucocephalus*)	SE, CFP/FT	Yes	Migrant and winter visitor primarily found near areas of open water. Uses open woodland and snags for roosting.	Not detected during the surveys. Bald eagles have occurred only infrequently during the winter at the Sweetwater Reservoir. Recently, a marked individual from Catalina Island spent several months at the reservoir, first occurring in 2002 and returning for the next two years. The bird commonly roosted in eucalyptus woodland, including the trees within the Master Plan area.
Merlin (*Falco columbarius*)	CSC/-	No	Winter visitor to coastal lowlands, marshes, grasslands, and agricultural areas.	Two merlins were detected during the surveys roosting in eucalyptus just south of the Dam. At the Sweetwater Reservoir, species occurrence has been recorded irregularly between mid-fall to early spring.
Peregrine falcon (*Falco peregrinus*)	SE, CFP/FD, FSC	Yes	Winter visitor to grasslands, agricultural areas, beach and aquatic associated sites, mudflats, urban areas. Localized breeding resident, using cliff edges or structures (e.g. bridges, towers, buildings).	Not detected during the surveys. However, Peregrine falcon have been recorded numerously at the Sweetwater Reservoir. This species occurs most commonly in the fall through early spring. Eucalyptus woodland immediately south of the Dam is one of the more favored roosting sites.
Canada goose (*Branta canadensis*)	-/-	Yes	Winter visitor to grasslands, agriculture, and freshwater lakes.	Not detected during the surveys. For the Sweetwater Reservoir, Canada goose are abundant in the late fall through winter and rarely into spring. The species is typically found in more open areas of the reservoir (aquatic and exposed bottom areas), and those aquatic areas of the Master Plan area are seemingly less preferred.
California gull (*Larus californicus*)	CSC/-	No	Migrant and winter visitor to a variety of coastal and inland habitats, including beaches, bays, freshwater lakes, mudflats, agricultural, and urbanized sites.	Not detected during the surveys. However, California gull is found at the Sweetwater Reservoir between fall and early spring, often occurring on the log-boom within the Master Plan area.

Table 5 (continued): Sensitive Wildlife Species Observed or Potentially Occurring

Species	Status State/Fed.	JWA NCCP Species	Habitats	Occurrence
Burrowing owl (*Athene cunicularia hypugaea*)	CSC/FSC	Yes	Resident to grasslands, agricultural fields, and coastal sand dunes. Nests in burrows, initially excavated by ground squirrels or other mammals.	Not detected during the surveys. The Sweetwater Reservoir property formerly supported burrowing owl but the breeding colonies have been absent for greater than ten years. Observation of burrowing owl on the Sweetwater Reservoir property have been made more recently in grassland habitat on the south side of the reservoir, but multiple birds have yet to be found. The likelihood of future occurrence within the Master Plan area is considered very low given the general unsuitability of existing habitats.
Red-naped sapsucker (*Sphyrapicus nuchalis*	-/FSC	No	Winter visitor to woodlands and orchards.	Not detected. Red-naped sapsucker, however, has been found in eucalyptus woodland within the Master Plan area. Extensive use of these wooded areas by sapsuckers is evident by the numerous sap rings on the trees. Red-breasted sapsucker is known to the same area, but the degree to which each species occurs has not been assessed.
Willow flycatcher (*Empidonax traillii*) * subspecies *extimus* only	SE/FE *	Yes	Migrants can occur in a variety of woodland or scrub habitats. Subspecies *extimus* is a late spring and summer breeding resident occupying riparian woodlands and thickets, closely associated with aquatic or saturated soil conditions.	Not detected. Willow flycatchers have been recorded during spring migration (subspecies unknown) in riparian woodland and coastal sage scrub in the middle and eastern portions of the Sweetwater Reservoir property. They have also been identified as infrequent or sporadic breeding residents (subspecies *extimus*) in dense riparian woodland of the same area. Despite these records, the likelihood of occurrence within the Master Plan area is considered extremely low given the fragmented nature of riparian habitat on-site, lack of established breeding colony in the nearby vicinity, and low remaining willow flycatcher population in California, especially for subspecies *extimus*.
Loggerhead shrike (*Lanius ludovicianus*)	CSC/-	No	Resident to grasslands, agricultural sites, and open coastal sage scrub and chaparral. Nests in low trees or dense shrub.	Not detected during the surveys. Loggerhead shrike has been observed to the east on the reservoir property in expansive grassland and sparse shrub habitat. While the species could occur, habitat within the Master Plan area is considered less suitable for this species.

Table 5 (continued): Sensitive Wildlife Species Observed or Potentially Occurring

Species	Status State/Fed.	JWA NCCP Species	Habitats	Occurrence
Least Bell's vireo (*Vireo bellii pusillus*)	SE/FE	Yes	Spring and summer breeding resident to riparian woodlands and scrub.	In 2004 and 2005, a breeding pair of least Bell's vireo was detected in riparian habitat below the Dam, but outside of the Master Plan area. Another pair was also detected in 2005 within coastal sage scrub habitat on-site. Riparian habitat within the Master Plan area is considered suitable and species occurrence is expected. Occurrence in coastal sage scrub is considered atypical but may persist for a few years due high territory fidelity by this species.
Coastal cactus wren (*Campylorhynchus brunneicapillus couesi*)	CSC/FSC	Yes	Resident to coastal sage and maritime succulent scrubs, closely associated with dense patches of coast cholla (*Opuntia prolifera*) or prickly pear cactus (*Opuntia littoralis*) for nesting.	Not detected during the surveys. Coastal cactus wrens are known to a few locations around the Sweetwater Reservoir, both west and east of the Master Plan area. One sizeable cholla cluster does occur in the eastern portion the survey area, although no evidence of prior nesting was found. It is possible that future occurrence in this area could occur, especially as other cacti in the area proliferates, thereby increasing habitat suitability.
Western bluebird (*Sialia mexicana*)	-/-	Yes	Resident and winter visitor to woodland edges, grasslands, urban landscaping. Breeding more common at higher elevations. Nest in tree cavities or nest boxes.	Not detected during the surveys. Western bluebird, however, have been recorded infrequently within the Treatment Plant compound and neighboring residential areas between winter and early spring.
California gnatcatcher (*Polioptila californica californica*)	CSC/FT	Yes	Breeding resident to coastal sage scrub, maritime succulent scrub, and occasionally chaparral.	Focused surveys within and immediately adjacent to the Master Plan area in 2004 revealed 11 to 13 breeding pairs of California gnatcatcher. All coastal sage scrub habitat within the survey area is considered occupied. The Sweetwater Reservoir property supports a relatively high population of this species.
Yellow warbler (*Dendroica petechia*)	CSC/-	No	Spring and summer breeding resident to riparian woodland and scrub.	Yellow warbler was identified in riparian woodland below the Dam as well as eucalyptus within the Treatment Plant compound. Breeding is known to the eastern limits of the Sweetwater Reservoir property but was not confirmed within the Master Plan area.
Yellow-breasted chat (*Icteria virens*)	CSC/-	Yes	Spring and summer breeding resident to riparian woodland and scrub.	Not detected during the surveys. Yellow-breasted chat is a common breeder to the eastern limits of the Sweetwater Reservoir. The species could potentially occur in suitable habitat within the Sweetwater River below the Dam.

Table 5 (continued): Sensitive Wildlife Species Observed or Potentially Occurring

Species	Status State/Fed.	JWA NCCP Species	Habitats	Occurrence
California horned lark (*Eremophila alpestris actia*)	CSC/-	No	Breeding resident as well as fall and winter migrant to sandy shores, grasslands, agriculture, and open scrublands.	Not detected during the surveys. California horned lark occur at other sites around the Sweetwater Reservoir, including observations of nesting. The species could potentially occur within the Master Plan area, although habitat is considered less suitable than other areas of the reservoir.
Bell's sage sparrow (*Amphispiza belli belli*)	CSC/-	Yes	Breeding resident to coastal sage scrub and chaparral.	Not detected. Bell's sage sparrow was formerly known to scrub habitat southwest of the Dam. The species has declined along the coast, including the Sweetwater Reservoir site. Although suitable habitat exists within the Master Plan area, the potential for occurrence is considered low.
Rufous-crowned sparrow (*Aimophila ruficeps canescens*)	CSC/-	Yes	Breeding resident to coastal sage scrub or grassland-coastal sage scrub intergrades, occurrence associated with steep and rocky sites.	Not detected during the surveys. Rufous-crowned sparrow has been recorded previously in open coastal sage scrub and disturbed habitat just west of the Dam and within the Master Plan area.
Tri-colored blackbird (*Agelaius tricolor*)	CSC/FSC	Yes	Resident to freshwater marsh, mixed riparian scrub – freshwater marsh, lakeshores, agriculture or disturbed sites, and wet meadows. Nests in freshwater marsh habitat.	Not detected during the surveys. The tri-colored blackbird is found infrequently at the Sweetwater Reservoir. Although the likelihood is low, suitable marsh-riparian scrub habitat occurs below the Dam, and the species could potentially occur in this area.
Mammals				
California leaf-nosed bat (*Macrotus californicus*)	CSC/-	No	Roosting in caves, mining tunnels, and buildings.	Bat reconnaissance surveys were not performed. The species has been recorded in the vicinity of the Sweetwater Reservoir by others and could potentially occur on-site.
Mexican long-tounged bat (*Choeronycteris mexicana*)	CSC/-	No	Roosting in caves, mining tunnels, and buildings.	Bat reconnaissance surveys were not performed. The species has been recorded in the vicinity of the Sweetwater Reservoir by others and could potentially occur on-site.
Townsend's big-eared bat (*Plecotus townsendii*)	CSC/-	No	Roosting in caves, mining tunnels, and buildings.	Bat reconnaissance surveys were not performed. The species has been recorded in the vicinity of the Sweetwater Reservoir by others and could potentially occur on-site.
Pallid bat (*Antrozous pallidus*)	CSC/-	No	Roosting in caves, mines, tunnels, rock crevices, buildings, and trees.	Bat reconnaissance surveys were not performed. The species has been recorded in the vicinity of the Sweetwater Reservoir by others and could potentially occur on-site.
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	CSC/-	No	Roosting in caves and rock crevices, and rugged canyons with high cliffs.	Bat reconnaissance surveys were not performed. A roost is known just west of the Dam at the abandoned rock quarry, last recorded in 2000.

Table 5 (continued): Sensitive Wildlife Species Observed or Potentially Occurring

Species	Status State/Fed.	JWA NCCP Species	Habitats	Occurrence
Western mastiff bat (*Eumops perotis*)	CSC/-	No	Roosting in tunnels, rock crevices, trees, and buildings.	Bat reconnaissance surveys were not performed. The species has been recorded in the vicinity of the Sweetwater Reservoir by others and could potentially occur on-site.
Black-tailed jackrabbit (*Lepus californicus bennettii)*	CSC/-	Yes	Semi-open habitats, coastal sage scrub, chaparral, and grassland.	Not detected. The species occurs at various locations around the reservoir. The species could potentially occur within suitable habitat on-site.
Dulzura pocket mouse (*Chaetodipus californicus femoralis*)	CSC/-	Yes	Coastal sage scrub and chaparral.	Small mammal trapping was not performed. Dulzura pocket mouse was recorded just west of the project site in 1994. The species could potentially occur within suitable habitat on-site.
San Diego pocket mouse (*Chaetodipus fallax*)	CSC/-	No	Open coastal sage scrub or grassland with sandy soils.	Small mammal trapping was not performed. San Diego pocket mouse was recorded just west of the project site in 1994. The species could potentially occur within suitable habitat on-site.
San Diego woodrat (*Neotoma lepida intermedia*)	CSC/-	No	Coastal sage scrub, maritime succulent scrub, chaparral, associated with cactus and rock outcrops.	Small mammal trapping was not performed. San Diego desert woodrat was recorded just west of the project site in 1994. The species could potentially occur within suitable habitat on-site.
Southern muledeer (*Odocoileus hemionus fuliginata*)	CSC/-	Yes	Widespread foothill, montaine, and desert slope habitat use.	Southern muledeer were observed during the surveys within coastal sage scrub habitat on-site.
Mountain lion (*Felis concolor*)	CSC/-	Yes	Widespread foothill, montaine, and desert slope habitat use.	Not detected. Occasional use of the reservoir lands by mountain lion has been recorded. Species occurrence on-site is likely, albeit rare or infrequent.

Table 5 (continued): Sensitive Wildlife Species Observed or Potentially Occurring

Status

SE = State Endangered
CSC = State Species of Special Concern
CFP = State Fully Protected
FT = Federally Threatened
FE = Federally Endangered
FD = Species Recovered, removed from Federally Endangered Species List
FSC = Federal Species of Special Concern

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obs.). In 2004, brown pelicans were first detected on the reservoir on June 9 (2 individuals). A peak number of 22 brown pelicans were recorded on October 4, 2004. Occurrence is generally observed across the entire reservoir, but the log boom area, just east of the Dam and within the Master Plan area, is a particularly favored spot.

Bald Eagle (*Haliaeetus leucocphalus*). The bald eagle is state endangered and federally threatened. Historically breeding in southern California, bald eagle occurrence is now typical of wintering observations in the vicinity of freshwater lakes where fish and waterfowl can be taken as prey. Former population declines have been attributed to the use of DDT. As a result of the U.S. ban on DDT, bald eagle populations have rebounded, causing the federal government to upgrade the status to threatened in 1995. Threats to the bald eagle still exist including starvation, particularly for young inexperienced eagles, illegal hunting, electrocution from overhead power lines, and collisions with vehicles. At the Sweetwater Reservoir, bald eagles have been a rare winter visitor or resident. For three recent winters (2001-2002, 2002-2003, and 2003-2004), a petagial tagged bald eagle has been detected at the reservoir. Verification of the tag number in 2002 found that the bird was an individual released as part of a captive rearing and reintroduction program on Santa Catalina Island, California. In 2002-2003, two individuals were present; the second individual was not marked. These individuals have been observed roosting at various locations around the reservoir, most notably the reservoir delta area, the south side eucalyptus grove, and the eucalyptus grove immediately east of the Dam (P. Famolaro pers. obs.). The latter site is within the Master Plan area.

Peregrine falcon (*Falco peregrinus*). Although the peregrine falcon has been removed or delisted from the federal endangered species list, it is still classified as endangered by the state of California. Once extirpated from much of its breeding range, the peregrine falcon has made a remarkable recovery, due primarily to the U.S. ban on DTT and captive rearing and reintroduction programs. Peregrine falcons live mostly along mountain ranges, river valleys, and coastlines, especially around mudflats, shores or ponds where they prey on other birds. Nesting sites include cliffs, high platforms, building towers, and bridges. At Sweetwater Reservoir, the peregrine falcon is a regular non-breeding visitor between fall and early spring. One and sometimes two individuals can be found at various sites around the reservoir. No site is more common than the eucalyptus grove immediately south of the Dam, which occurs within the Master Plan area.

California gnatcatcher (*Polioptila californica californica*). The California gnatcatcher is listed as federally threatened and is a state Species of Special Concern. The species is a year-round resident, primarily occupying coastal sage scrub habitat. Population declines are a result of extensive loss of habitat in southern California due to urban and agricultural development as well as brood parasitism by brown-headed cowbirds. The federal listing of the California gnatcatcher provided an impetus for the current multi-species and habitat conservation planning under the State Natural Community Conservation Program Act of 1991. Coastal sage scrub surrounding the Sweetwater Reservoir contains a relatively dense population of the species (P. Famolaro pers. obs.). These lands, including the Master Plan area, are currently proposed as federal critical habitat for the species (USFWS 2003). As a result of the focused survey effort in 2004, it was determined that between eleven (11) and

thirteen (13) pairs occur within and immediately adjacent to the Master Plan area (**Figure 4**). Additional surveys and/or population monitoring studies, probably requiring color banding of individual gnatcatchers, would be necessary for a more precise abundance assessment. Nearly all coastal sage scrub on-site was identified as occupied during the surveys or from previous incidental records (P. Famolaro pers. obs.). No nests were identified during the surveys, although nesting behavior (e.g. collection and carrying of nest material) was observed.

Least Bell's Vireo (*Vireo bellii pusillus*). The least Bell's vireo is listed as endangered by the state and federal resource agencies. The species is a spring and summer resident occupying riparian woodland, scrub, and thickets within major drainages and tributaries of the coastal plain, foothills, and mountain zone, as well as the desert slope. Populations declined due to loss of suitable habitat resulting from urban and agricultural development, flood control, dams and reservoirs, and brood parasitism from the brown-headed cowbird (*Molothrus ater*). Since listing, regulatory protection and restoration of habitat coupled with extensive trapping and removal of cowbirds have aided in the species recovery. The extensive riparian habitat at the Upper Sweetwater Reservoir and contiguous segment of river on the San Diego National Wildlife Refuge has been monitored routinely by a variety of public organizations and private consulting groups since 1984 (Westec Services Inc., San Diego State University, Regional Environmental Consultants [RECON], San Diego National Wildlife Refuge, and Sweetwater Authority). The area has supported over 100 breeding territories of least Bell's vireo at highest count (P. Famolaro, pers. obs.) and is designated as federal critical habitat for the species (USFWS 1994). Riparian habitat downstream of the Dam has supported a maximum of one pair since initial surveys in 1992 (RECON 1995a and 1995b) and is not designated as federal critical habitat. Annual follow up surveys thereafter by the Sweetwater Authority have revealed similar results with no more than one pair detected between the Dam and the Bonita Golf Course (P. Famolaro pers. obs.). In 2004 and 2005, a single breeding pair was present downstream of the Master Plan area (Figure 4), immediately east of the State Route 125 construction corridor. Species occurrence within the Master Plan area is expected given the close proximity of these records and suitability of habitat within the Master Plan area. The degree to which they may occur, however, would require further, more detailed evaluation. It should be noted that brown-headed cowbirds do occur in the area, but the Sweetwater Authority performs control activities in the vicinity of the Sweetwater Reservoir throughout the spring/summer nesting season.

Also in 2005, a second breeding pair was detected within coastal sage scrub habitat immediately east of the Treatment Plant and within the Master Plan boundary (Figure 4). Although atypical, the use of coastal sage scrub for territory placement and breeding purposes has been observed previously elsewhere at the Sweetwater Reservoir and other sites in San Diego County (P. Famolaro pers. obs, B.Kus pers. comm.). Territory establishment in upland habitats (e.g. coastal sage scrub) appears to be associated with heavy rainfall years when vegetation is particularly lush and in close proximity to a high density least Bell's vireo population. In addition, upland habitat sites may contain a rather high concentration of non-native ruderal species, particularly black mustard (*Brassica nigra*), as well as at least one to several large shrub to tree features such as laurel sumac, Mexican elderberry (*Sambucus mexicana*), pepper trees (*Schinus* sp.), and/or other ornamental escapees. Established

Figure 4
California Gnatcatcher and Least Bell's Vireo Survey Information

California gnatcatcher observations (2004)
- 1st survey
- 2nd survey
- 3rd survey

Least Bell's vireo breeding pair (see label for year)

Master Plan project area

200 0 200 400 600 Feet

SWEETWATER AUTHORITY

territories can persist in subsequent years even with reduced rainfall levels due to high territory fidelity of this species. Eventually, territory will be abandoned for more traditional riparian woodland and scrub habitats. In some cases, these upland territories can be reestablished following similar, high rainfall seasons.

4. Wildlife Corridors

Habitat connectivity is essential to maintaining long-term biological viability of natural open space and the animals that occupy on these areas. Animal movement, home range and territories, recruitment, dispersal, prey or forage availability, and refugia can all be contingent on habitat patch size and linkages with adjoining or neighboring open space. In pristine environments, wildlife can take full advantage of the variety of terrains available (e.g. drainages, riparian corridors, valleys, hill slopes, ridgetops, etc.). As human developments and land uses encroach into remaining natural lands, terrain options are minimized, or cut off by roads, structures, or intensive agriculture. Wildlife corridors become necessary to maintain biological function and genetic exchange among neighboring species populations. In general, the larger the corridor, the better its chance for functional success.

At the western limits of the Sweetwater Reservoir, intensive residential development occurs both to the north, west, and southwest. The remaining natural lands function as a wildlife movement corridor and habitat linkage for natural lands to the west in the lower Sweetwater River valley, as well as in the National Wildlife Refuge to the east and southeast. Although the Dam and Treatment Plant facilities provide some disruption of habitat linkage to the north, the Master Plan area is considered inclusive within this wildlife corridor. This is demonstrated by observations of large vertebrate species, namely mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), and bobcat (*Felis rufus*) within the project survey area. These species are even occasionally sited within the Treatment Plant compound (P. Famolaro pers. obs.). Reptiles and amphibians such as the western skink (*Eumeces skiltonlanus*), orange-throated whiptail (*Cnemidophorus hyperythrus beldingi*), southern pacific rattlesnake (*Crotalus viridis*), and western toad (*Bufo boreas*) have been observed along existing road surfaces or around buildings or facilities in the Treatment Plant compound, demonstrating their intended dispersal through the site (P. Famolaro pers. obs.). In addition, the identified high density California gnatcatcher population suggests that recruitment and dispersal are being maintained for this species.

V. Evaluation of Biological Resources

Although the existing Treatment Plant and Dam facilities occupy much of the Master Plan project area, the overall biological value of the site is considered to be high. The quality of native plant communities is considered slightly lower where prior disturbance is evident or for riparian habitat below the Dam, but the presence of several sensitive species on-site increases the value of these areas. Most notably, coastal sage scrub on-site supports a dense population of California gnatcatchers. Although considered somewhat atypical, the use of on-site coastal sage scrub habitat by the least Bell's vireo adds to its value. Eucalyptus woodland is an exotic plant community and in general of low value. However, the regular

use of eucalyptus trees on-site by a variety of raptor species increases the value of this woodland plant community. Disturbed or ruderal vegetation areas also contribute to the overall value of the site since these too are utilized by sensitive species. Open water habitat within the reservoir is artificial, having been created with construction of the Dam. The Sweetwater Reservoir has been in operation for over 100 years, however, and it supports a large diversity of aquatic associated avifauna.

The Master Plan area is also directly connected to much larger habitat patches to the east and west and is considered part of a functional wildlife movement corridor, especially for animal movement and dispersal from the north side of the reservoir. Understandably, this identified wildlife corridor on the north side of the reservoir is not entirely ideal given its relatively narrow width, which is disrupted by existing roads and facilities within the Treatment Plant compound. However, observations of wildlife use illustrate its benefit to the overall biological integrity of the area.

The Sweetwater Reservoir and surrounding lands are also considered a regionally important resource to a variety of native species that occupy its boundaries. The County Multiple Species Conservation Program (MSCP) identifies the Master Plan area as part of a Biological Core Area that generally contains a high concentration of sensitive species (Ogden 1998).

VI. Relationship to JWA NCCP

Natural Community Conservation Programs (NCCP) are state sponsored programs endorsed by the federal government to balance the needs of urban development and economic growth, with species and habitat protection. NCCPs employ a multi-habitat and multi-species conservation planning approach, focusing on preserving the largest core habitat areas possible while protecting necessary habitat linkages and wildlife movement corridors that are necessary to maintain long-term biological and genetic diversity. Sweetwater Authority initiated development of the Joint Water Agency (JWA) NCCP in 1996 in conjunction with Helix Water District and Padre Dam Municipal Water District. The JWA NCCP is considered complimentary to the County MSCP because sensitive lands within water district ownership were excluded from the County's plan. The JWA plan is nearing completion with the Subregional Plan currently under review by the wildlife agencies. The respective Subarea Plans along with the Environmental Impact Report/Environmental Impact Statement are nearing completion. Final "take" authorization packages are scheduled for submittal by Summer 2005. While the plans are well underway, the JWA NCCP has not yet been adopted by the various water agencies' Boards of Directors. This is not expected until the final Implementing Agreement is reviewed and approved.

Both the Treatment Plant upgrade project and south spillway Dam improvements are designated in the Sweetwater Authority Subarea Plan as Planned or Conceptual Projects. As proposed, projects with this designation will be authorized for future habitat and species impacts through the Implementing Agreement. Habitat compensation will be provided through the conservation easement at the Sweetwater and Loveland Reservoirs where lands will be set aside and managed in preserve. Permits for wetlands and/or USACE jurisdictional waters will still be required in addition to compliance with the California

Environmental Quality Act (CEQA) or, if necessary due to federal project involvement, the National Environmental Policy Act (NEPA).

VII. Project Impacts

The Master Plan currently includes upgrades to the existing Treatment Plant as well as improvements to the southern spillway of the Dam. In the future, additional facilities may be added within the Master Plan area to meet both water storage and treatment needs resulting from increased demand or new drinking water regulatory requirements. The design for any of the intended improvements has not been completed, and as such, calculation of specific impacts is not possible at this time. When designs are complete, information contained in this biological technical report should be compared with the various project alternatives and impacts analyzed. For this reason, plant communities and sensitive species locations have been plotted digitally using geographic information systems (GIS) software. Future digital designs with a matching coordinate system can easily be compared to assess project impacts. Habitat impacts should be divided into those that are permanent, as in the placement of a facility or structure, and those that are temporary including construction access roads or staging areas.

In general, project impacts to sensitive biological resources should be avoided or minimized to the maximum extent practicable. This will not only help preserve declining biological resources but will reduce necessary compensatory measures as described below. Additionally, project features should be considerate to habitat connectivity through the Master Plan area so that the existing wildlife corridor on the north side of the reservoir is maintained.

Operation of new facilities could also have the potential to affect adjacent wildlife. In particular, noise levels associated with the new Treatment Plant could exceed levels accepted for the California gnatcatcher and least Bell's vireo. Currently, 60 dBA L_{eq} is the noise threshold recognized by the wildlife agencies. Treatment Plant upgrades should consider facility elements or technologies that will reduce ambient noise levels if necessary.

Vehicle traffic within the Treatment Plant compound is not expected to increase due to new deliveries or services (D. Thomson pers. comm.) and should not pose a significant impact to wildlife. It is understood that traffic will be restricted to existing or planned roads that are or will be posted at a 10 mile per hour speed limit. Any future increase in traffic volume or speed beyond current levels should be evaluated to determine negative affects to wildlife.

VIII. Compensatory Mitigation and Recommendations

Compensatory mitigation described below assumes prior completion and adoption of the JWA NCCP. In the event this plan is not approved or implemented by the Sweetwater Authority or the wildlife agencies, the projects covered by the Master Plan will require processing via alternative methods. These may include obtaining a habitat loss permit through: (1) the County's MSCP; (2) an individual Habitat Conservation Plan through the USFWS, and (3) a Section 7 consultation, if a federal project nexus is involved (i.e. USACE

permit or federal funding agency). Both items 2 and 3 will also require a Memorandum of Understanding with CDFG.

Subsequent to final design, precise project impacts and habitat replacement requirements will be determined. Project impacts will be mitigated in accordance with the JWA NCCP Subregional Plan (TAIC 2004). Anticipated JWA NCCP acreage replacement ratios are provided in **Table 6**.

Table 6: Recommended Mitigation Ratios

Plant Community	Temporary Impacts	Permanent Impacts
Coastal sage scrub	1:1	2:1
Riparian woodland/scrub	1:1	3:1
Eucalyptus woodland	-	0.5:1
Disturbed or ruderal vegetation	-	0.5:1

Compensation for disturbed lands is necessary due to its value to wildlife, including sensitive species on-site. Loss of open water within the reservoir is not anticipated for any Master Plan improvements, and no compensation is required for identified developed lands, including existing roads, facilities, or material storage sites.

Replacement habitats should contain similar species, in comparable concentrations, as those found in the project impact areas. For instance, any coastal sage scrub replacement should be occupied by California gnatcatchers versus unoccupied habitat that would not be considered commensurate mitigation. Replaced habitat should be sited as close as possible to the project impact so as to maintain the overall biological integrity of the area (e.g. the Sweetwater Reservoir – San Miguel Core Resource Area). An accounting of impacts and compensatory mitigation will ultimately be provided to USFWS and CDFG via the annual reporting of the JWA NCCP or as otherwise approved by these agencies.

For coastal sage scrub impacts, no additional habitat compensation should be required for least Bell's vireo beyond what is required for the California gnatcatcher. Coastal sage scrub mitigation lands of similar habitat quality and in close proximity to core least Bell's vireo populations should provide similar value to accommodate occasional or irregular least Bell's vireo territory establishment.

Impacts to riparian habitat may require "creation" for permanent losses or "enhancement" for temporary impacts. If riparian habitat is determined to be under USACE jurisdiction, impacts and mitigation will require compliance with the federal "no-net-loss" wetlands policy. Both CDFG and USACE should be consulted for any anticipated riparian habitat impacts. Additionally, USACE may also take jurisdiction within the open water reservoir area in the event that improvements in this area become necessary. A detailed wetland

delineation of any project areas within identified jurisdictional boundaries is recommended prior to consulting these agencies.

Impacts to identified federal critical habitat (i.e. Otay tarplant and California gnatcatcher) will only apply if the federal government is involved in the Master Plan project or any such phase. Federal funding or permitting (e.g. USACE permit) of the project would necessitate a review of critical habitat by the USFWS. This would most likely occur between the two federal agencies through a Section 7 consultation under the Federal Endangered Species Act of 1973 as amended.

The Quino checkerspot butterfly was not identified during focused surveys for this species in 2004. USFWS should be consulted in the year immediately prior to construction to determine if updated butterfly surveys will be necessary. Similarly, updated least Bell's vireo surveys should be performed to determine occurrence within a specific project construction boundary. Results of these surveys should be coordinated with USFWS and/or CDFG, as appropriate, to determine any necessary project actions.

To the extent feasible, the project designs should consider maintaining habitat linkages through the Master Plan area. While the existing wildlife corridor through the northern portion of the Master Plan area may not be optimal, an archipelago of small habitat patches among industrial land use and relatively low vehicle activity can facilitate successful animal movement.

Several sensitive bat species are known to occur within or in the vicinity of the Master Plan area. As bat surveys were not conducted under this biological inventory, further assessment of these winged mammals is recommended. Specifically, potential roost sites should be inspected by a biologists specializing in the ecology of bats in San Diego County. Surveys are only recommended for any planned construction or improvements on the Dam, including spillways, vents, and access tunnels, or adjacent rock crevices. For any identified bat roost, construction should avoid the period between March 15 and August 15 to preclude disturbance of a maternity colony. If unavoidable, bat exclusion barriers could be installed prior to any work. Specific techniques should be consulted with a bat specialist.

The following additional measures are recommended to further avoid, reduce, or minimize construction related impacts.

- Brushing activities in occupied coastal sage scrub should be conducted between September 1 and February 15 to avoid the California gnatcatcher nesting season. Where least Bell's vireo are determined to be present, removal of vegetation should occur between October 1 and March 15 to avoid impacts to this species.

- During the California gnatcatcher or least Bell's vireo nesting seasons, noise levels from construction activities should be reduced at or below 60 dBA L_{eq} to comply with current wildlife agency standards. In addition to avoidance, possible noise abatement techniques could include the construction of a temporary sound wall, the use of sound blankets, and/or the installation of noise-reducing mufflers on equipment.

- Temporary exclusionary fencing should be installed at the project brushing limits and maintained to avoid accidental intrusions into adjoining sensitive habitats.

- A project biologist should be assigned to ensure compliance with all biological constraints. Duties would include monitoring all phases of construction, assessing and coordinating any project area adjustments, and providing a biological resources education program to construction managers and crew prior to any construction.

- Temporarily disturbed areas or manufactured slopes should be revegetated with appropriate native species.

- An assessment of ambient noise generated from new Treatment Plant facilities (e.g. pumps, motors, etc.) should be conducted to determine if new noise levels will exceed 60 dBA L_{eq} for the California gnatcatcher and least Bell's vireo. If new ambient noise exceeds 60 dBA L_{eq}, noise reduction features should be implemented to reduce noise below this threshold. Alternatively, potential noise impacts should be consulted with the wildlife agencies to determine other mitigation strategies.

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ATTACHMENT 1

Quino Checkerspot Butterfly Survey Report. Reising Enterprises. August 5, 2004

August 5, 2004

Peter Famolaro
Principal Field Biologist
Sweetwater Authority
100 Lakeview Ave.
Spring Valley, CA 91977

RE: Quino Checkerspot Butterfly (*Euphydryas editha quino*) Bioassessment and Adult Survey for Sweetwater Authority's Filter Plant Expansion Project

Mr. Peter Famolaro,

INTRODUCTION

Sweetwater Authority (SWA) has requested protocol level surveys be performed for the Quino checkerspot butterfly (QCB) within the area surrounding the Robert Perdue Filter Plant located at 100 Lakeview Avenue, Spring Valley, California, 91977. Lara Reising conducted a bioassessment for suitable QCB habitat in addition to protocol level surveys for adult QCB within an approximately 69 acre site, centered on the filter plant itself. The site assessment was conducted on March 1, 2004. The surveys were conducted between March 8 and April 19, 2004. Dates and times of surveys and weather conditions are listed in Table 1. A copy of the U.S. Fish and Wildlife Service (USFWS) 45-Day Report, dated June 21, 2004, was submitted to Sweetwater Authority on July 1, 2004.

METHODS

Site Assessment

The USFWS recommends that site assessments be conducted for all project sites within the USFWS delineated survey areas (USFWS, 2002). The site for Sweetwater Authority's Filter Plant Expansion Project is located outside of and along the western border of USFWS' Survey Area 1 (See Appendix). The site assessment protocol followed guidelines delineated within the USFWS' Quino Checkerspot Butterfly (*Euphydryas editha quino*) Survey Protocol Information, 2002.

The site assessment was conducted on March 1, 2004, prior to the first butterfly survey. Surveying the project area consisted of assessing the habitat as either excluded areas or butterfly survey areas. Excluded areas are defined by the USFWS (USFWS, 2002) as those areas within: orchards, developed areas, or small in-fill parcels largely dominated by non-native vegetation, active/in-use agricultural fields without natural or remnant inclusions of native vegetation, closed-canopy forest or riparian areas, dense chaparral, and small openings (less than an acre)

completely enclosed within dense chaparral. Butterfly survey areas are defined as those areas that are not excluded.

QCB Surveys

The QCB survey protocol followed guidelines delineated within the USFWS' Quino Checkerspot Butterfly (*Euphydryas editha quino*) Survey Protocol Information, 2002. Lara Reising, a permitted QCB biologist, conducted protocol surveys, exclusive of any other focused survey, between March 8 and April 19, 2004. Surveys were conducted for a total of seven weeks during the flight season, at approximate week intervals. Approximately half of the total 69 acres (35 acres) was considered suitable QCB habitat. Total survey time of the 35 acres was approximately four hours, at an approximate rate of 9 acres per hour. In general, survey routes through vegetation were along the paths of least resistance, and approximately parallel and 25 feet apart. Surveys were conducted only during acceptable weather conditions (i.e. sustained winds of less than 15 miles per hour, temperature in the shade at ground level less than 60° F on a clear sunny day or less than 70° F on an overcast day. No weekly surveys were missed. Sites were surveyed for QCB adults and QCB larval host plants and adult nectaring plants. In addition, the sites were surveyed for plant community composition.

RESULTS

Site Assessment

The project site is located within an area that consists of developed, industrial areas, disturbed to high quality coastal sage scrub, riparian woodland, and eucalyptus woodland, to the north, west, and south of the dam (See Figure 1). The project area was separated into Sites 1 through 7 and the riparian woodland (See Figure 2) during the site assessment for ease in reporting. The industrial/developed areas, Site 7 [eucalyptus (*Eucalyptus* sp.) woodland], and the riparian woodland were excluded from subsequent protocol level surveys because they lack appropriate QCB habitat as defined in the United States Fish and Wildlife Service's Quino Checkerspot Butterfly (*Euphydryas editha quino*) Survey Protocol Information, 2002. Sites 1 through 6 cover an area of approximately 35 acres and contain coastal sage scrub vegetation in various degrees of disturbance with a canopy cover of more and less than 50 percent.

QCB Surveys

No QCB adults were observed within the project area. In addition to surveying for adult QCB, the project area was surveyed for the QCB's primary and secondary larval host plants and adult nectaring plants as outlined in the United States Fish and Wildlife Service's Recovery Plan for the Quino Checkerspot Butterfly (*Euphydryas editha quino*), 2003. No larval host plants [Coulter's snapdragon (*Antirrhinum coulterianum*), dark-tip bird's beak (*Cordylanthus rigidus*), desert plantain (*Plantago patagonica*), plantain (*P. erecta*), and purple owls-clover (*Castilleja exserta*)] were observed within the entire project area. A list of the adult nectaring plants observed within Sites 1 through 7 is given within Table 2.

Vegetative Communities

Site 1 contains disturbed coastal sage scrub dominated by broom baccharis (*Baccharis sarothroides*), mustard (*Brassica* sp.), and California sagebrush (*Artemisia californica*), and to a lesser degree laurel sumac (*Malosma laurina*), California buckwheat (*Eriogonum fasciculatum*),

and deerweed (*Lotus scoparius*). The following is a list of the observed plants in bloom within Site 1: acacia (*Acacia* sp.), alyssum (*Lobularia maritima*), Bermuda buttercup (*Oxalis pes-caprae*), black sage (*Salvia mellifera*), California buckwheat, common dandelion (*Taraxacum officinale*), cryptantha (*Cryptantha* sp.), deerweed, long-beak storksbill (*Erodium botrys*), gnaphalium (*Gnaphalium* spp.), long-stem golden-yarrow (*Eriophyllum confertiflorum*), morning-glory (*Calystegia macrostegia*), mustard, onion (*Allium* sp.), red-stem storksbill (*E. cicutarium*), San Diego sunflower (*Viguiera laciniata*), sea-lavender (*Limonium californicum*), tocalote (*Centaurea melitensis*), and wishbone plant (*Mirabilis laevis*).

Site 2 spans several vegetative communities. A chain-link fence demarcates the area routinely accessed by SWA to the south and nonnative grassland and eucalyptus woodland to the north. The area south of the fence contains mostly bare ground with scattered patches of ruderal vegetation and areas used to store equipment. Vegetation observed in bloom south of the fence includes: common dandelion, mustard, San Diego sunflower, and storksbill. Vegetation observed in bloom north of the fence includes: blue dicks (*Dichelostema capitatum*), California buckwheat, California encelia (*Encelia californica*), garland (*Chrysanthemum coronarium*), gnaphalium, long-stem golden-yarrow, mustard, San Diego sunflower, and storksbill (*Erodium* sp.).

Site 3 contains disturbed coastal sage scrub dominated by California buckwheat, California encelia, California sagebrush, jojoba (*Simmondsia chinensis*), spineshrub (*Adolphia californica*), and fountain grass (*Pennisetum* sp.). The following is a list of the observed plants in bloom within Site 3: adolphia, black sage, blue dicks, bushmallow (*Malacothamnus fasciculatus*), California buckwheat, California encelia, deerweed, jojoba, long-stem golden-yarrow, mustard, San Diego sunflower, storksbill (*Erodium* sp.), tree tobacco, and wishbone plant.

Site 4 borders the northern edge of the reservoir and contains maritime succulent scrub and coastal sage scrub with several dirt access roads running through it. Vegetation within Site 4 is dominated by California sagebrush, California buckwheat, broom baccharis, black sage, mustard, and coast cholla (*Cylindropuntia prolifera*). The following is a list of the observed plants in bloom within Site 4: black sage, blue dicks, California buckwheat, coast monkey flower (*Mimulus aurantiacus*), cryptantha (*Cryptantha* sp.), deerweed, gnaphalium (*Gnaphalium* spp.), lemonadeberry (*Rhus integrifolia*), long-stem golden-yarrow, manroot (*Marah macrocarpus*), morning-glory, mulefat (*Baccharis salicifolia*), mustard, popcorn flower (*Plagiobothrys* spp. and *Cryptantha* spp.), San Diego sunflower, scarlet pimpernel (*Anagallis arvensis*), storksbill (*Erodium* sp.), tocalote, and wishbone plant.

Site 5 contains disturbed coastal sage scrub dominated by California sagebrush, broom baccharis, San Diego sunflower, and fountain grass. The following is a list of the observed plants in bloom within Site 5: blue dicks, bladderpod (*Isomeris arborea*), deerweed, long-stem golden-yarrow, morning-glory, mustard, San Diego sunflower, storksbill (*Erodium* sp.), and wishbone plant.

Site 6 contains coastal sage scrub with a mixed canopy cover and bordered the southern edge of the reservoir, south of the dam. Some areas of this site include dense patches of laurel sumac, lemonadeberry, and jojoba and/or nonnative grassland. These dense areas (with greater than 50 percent ground cover) were excluded from the surveys. Vegetation within Site 6 is dominated by California sagebrush, California buckwheat, broom baccharis, black sage, and deerweed. The

following is a list of the observed plants in bloom within Site 6: bedstraw (*Galium* sp.), black sage, blue dicks, bushmallow, California buckwheat, California sagebrush, coast monkey flower, deerweed, fiddleneck (*Amsinckia* spp.), lemonadeberry, long-stem golden-yarrow, lupine (*Lupinus* sp.), manroot, miner's-lettuce (*Claytonia perfoliata)*, mulefat, mustard, onion, San Diego sunflower, snapdragon [(*Antirrhinum* sp.), (NOT Coulter's snapdragon)], storksbill (*Erodium* sp.), and wishbone plant.

DISCUSSION

No QCB adults were observed in the approximately 35-acre survey area surrounding the filter plant. Historically, according to the California Department of Fish and Game's Natural Diversity Database (CNDDB) (CDFG, 2004), the closest and most recent sighting of the QCB to the SWA Filter Plant was observed in 2003, approximately 4 miles east of the project area, northeast of Mother Miguel Mountain and southeast of Sweetwater Reservoir. The next closest observations occurred in 2001, approximately 4.25 miles east-northeast of the project site and in 1990, approximately 4.5 miles east of the project site. The location of the 2001 sighting is currently within a recently developed residential community.

Sites 1 through 5 contain QCB habitat in varying degrees of disturbance. These sites are surrounded by industrial and residential areas and Sweetwater Reservoir. The potential for QCB to occur within Sites 1 through 5 is low due to the absence of or scarcity of host plants, the high degree of repeated disturbance and/or the fragmentation of the habitat and lack of recent sightings (since 1990) within the area, according to the CNDDB.

The area south of the filter plant and dam (Site 6) contains habitat most likely to contain QCB based on the lack of disturbance and connectivity to surrounding, intact coastal sage scrub vegetation and undeveloped land. However, no QCB adults or QCB host plants were observed within this survey area and no QCB have been detected within approximately 4 miles of the project site (since 1990) according to the CNDDB.

The notification for the initiation of surveys, along with all applicable email correspondences with the USFWS, have been included for your reference in the Appendix. Please call me at (530) 304-0770 if you have any questions.

Lara Reising
(Permit Number TE-039161-1)

CITATIONS

California Department of Fish and Game. 2004. Natural Diversity Database.

U.S. Fish and Wildlife Service. 2003. Recovery Plan for the Quino Checkerspot Butterfly (*Euphydryas editha quino*). Portland, Oregon. x + 179 pp.

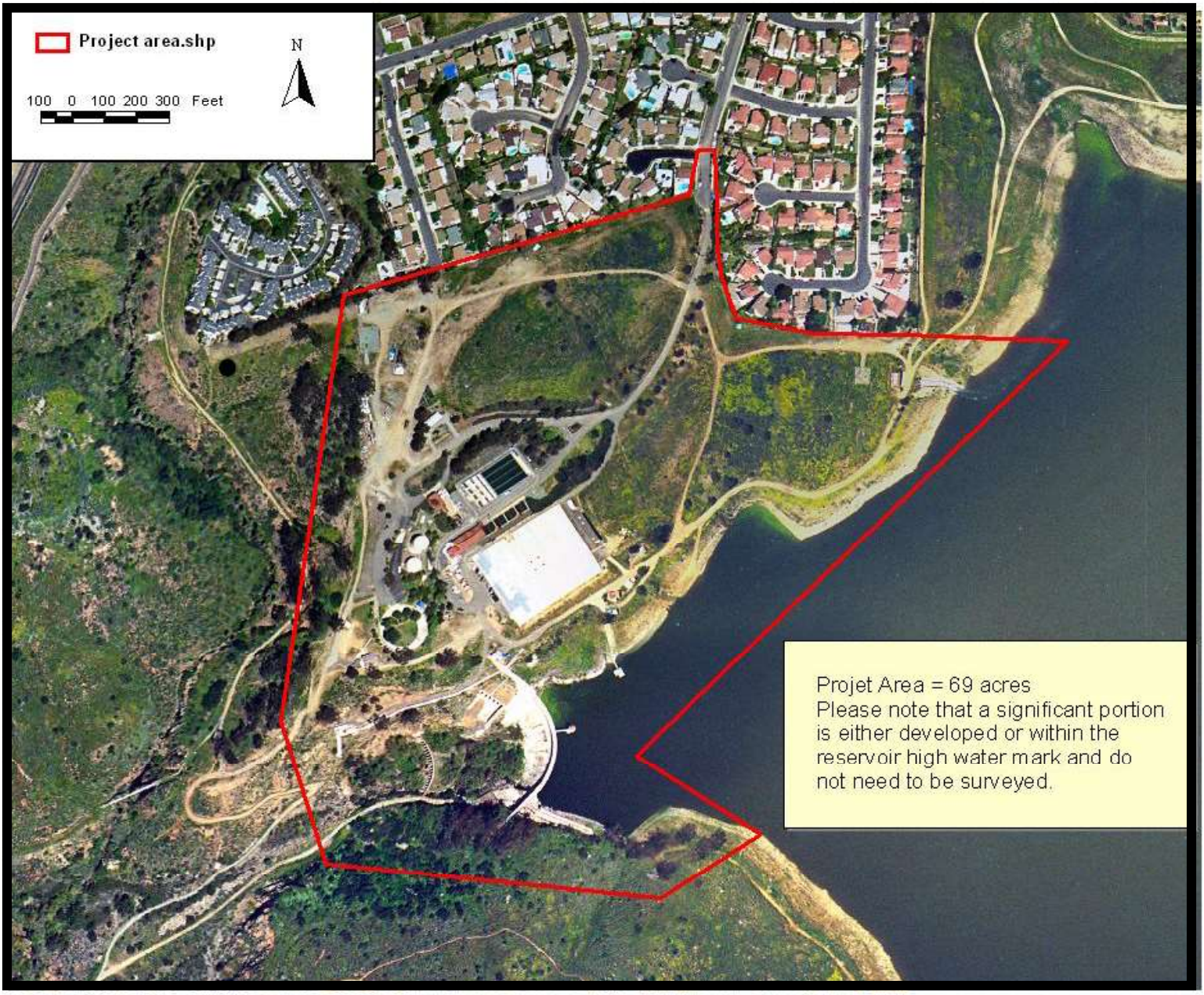
U.S. Fish and Wildlife Service. 2002. Quino Checkerspot Butterfly (*Euphydryas editha quino*) Survey Protocol Information. Carlsbad, California. x + 9 pp.

Table 1: List of Butterflies Observed During Each Weekly Survey

Date/Time Surveyed	Butterflies Observed	Air Temperature/Wind Speed/Weather Conditions
Survey 1		
March 8, 2004/ 1000-1300	cabbage white (*Pieris rapae*), painted lady (*Vanessa cardui*), Sara orangetip (*Anthocharis sara*)	86ºF/0-3 mph winds/Sunny, clear skies
March 9, 2004/ 0845-0930	funereal duskywing (*Erynnis funeralis*), Sara orangetip, southern blue (*Glaucopsyche lygdamus australis*)	78ºF/0-3 mph winds/Sunny, clear skies
Survey 2		
March 15, 2004/ 0900-1010	funereal duskywing, painted lady	64ºF/0-2 mph winds/Clear skies, slight haze
March 16, 2004/ 0930-1200	brown elfin (*Callophrys augustinus*), cabbage white, funereal duskywing, painted lady, Sara orangetip, southern blue	68ºF/3-5 mph winds/Clear skies, slight haze
Survey 3		
March 22, 2004/ 0900-1000	None	Inappropriate weather conditions: 66ºF/5-8 mph winds/100% cloud cover
March 23, 2004/ 1100-1130	None	Inappropriate weather conditions: 62ºF/5-8 mph winds, with gusts between 10 and 12 mph/100% cloud cover
March 24, 2004/ 1350-1600	funereal duskywing, painted lady, Sara orangetip, marine blue (*Leptotes marina*)	72ºF/5-8 mph winds, with gusts up to 12 mph/mostly cloudy
March 25, 2004/ 0945-1200	anise swallowtail (*Papilio zelicaon*), funereal duskywing, painted lady	69ºF/0-3 mph winds/mostly sunny with a few scattered clouds
Survey 4		
March 30, 2004/ 0800-1045	common white (*Pieris protodice*), funereal duskywing, painted lady, Sara orangetip, southern blue	66ºF/0-2 mph winds/Clear skies
Survey 5		
April 6, 2004/ 1200-1400	Behr's metalmark (*Apodemia virgulti*), cabbage white, painted lady, southern blue	70ºF/3-5 mph winds, with gusts up to 8 mph/Clear skies
April 7, 2004/ 1130-1340	funereal duskywing, marine blue, west coast lady (*Vanessa annabella*)	72ºF/2-5 mph winds/Partly Cloudy
Survey 6		
April 13, 2004/ 1000-1320	Behr's metalmark, common white, funereal duskywing, southern blue, west coast lady	68ºF/0-2 mph winds/Clear skies
Survey 7		
April 19, 2004/ 1200-1500	cabbage white**,** funereal duskywing, marine blue, western pygmy-blue (*Brephidium exile*)	68ºF/5-8 mph winds/Mostly sunny, scattered clouds

Table 2: List of Larval Host Plants, Nectar Plants, and Plant Communities Observed

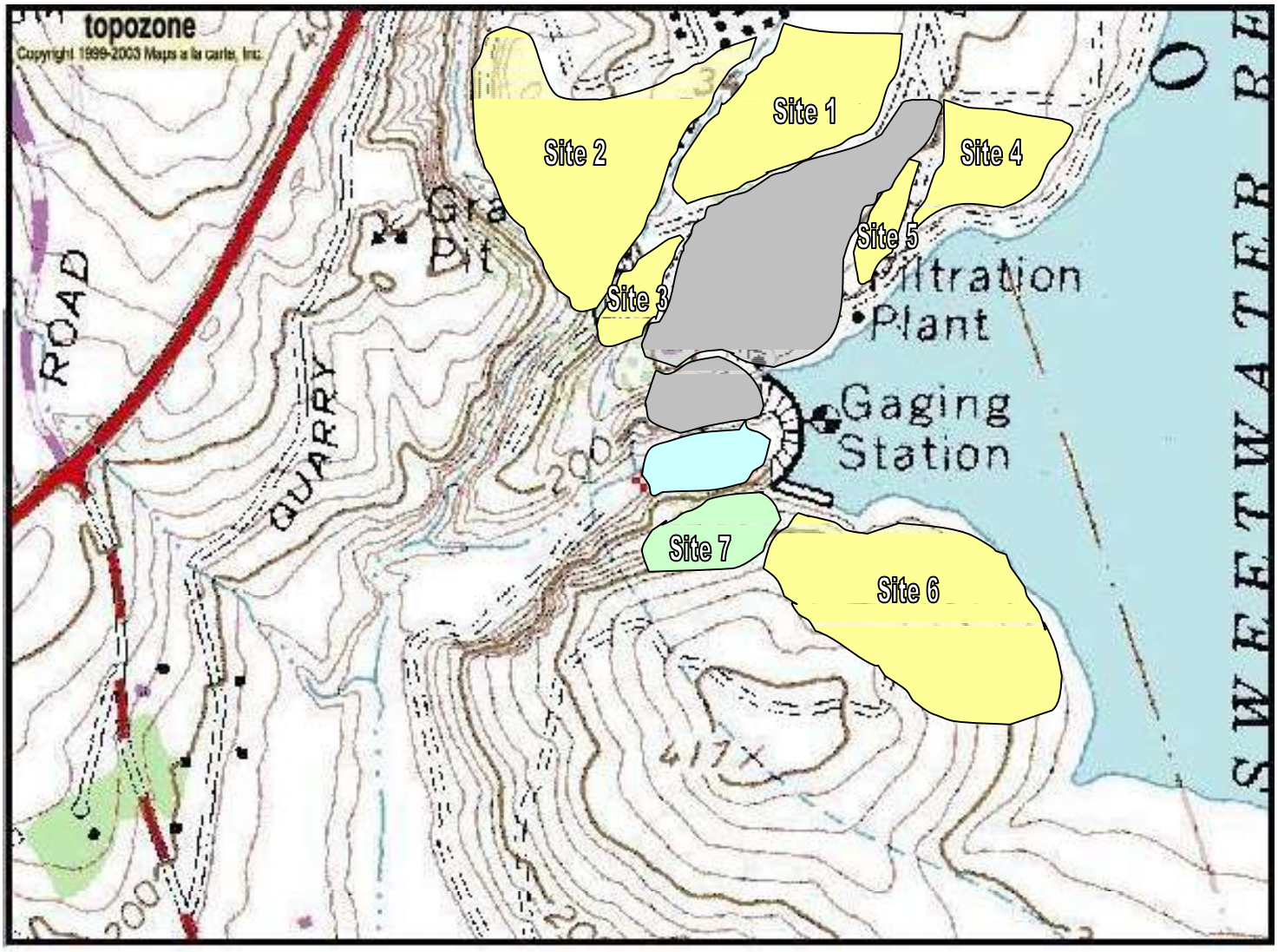
Sites	Plant Communities	Larval Host Plants and Nectaring Plants
1	Highly disturbed coastal sage scrub	blue dicks (*Dichelostema capitatum*), California buckwheat (*Eriogonum fasciculatum*), deerweed (*Lotus scoparius*), fiddleneck (*Amsinckia* spp.), long-stem golden-yarrow (*Eriophylum confertiflorum*), mustard (*Brassica* sp.), onion (*Allium* sp.), popcorn flower (*Cryptantha* spp.),
2	Mostly bare ground bordered by residences, eucalyptus woodland, and nonnative grassland with coastal sage scrub elements beyond the northern fence of Sweetwater property. Areas within the fence limit used for storage of equipment	blue dicks, California buckwheat, long-stem golden-yarrow, mustard
3	Disturbed coastal sage scrub	blue dicks, California buckwheat, deerweed, mustard
4	Coastal sage scrub	blue dicks, California buckwheat, deerweed, long-stem golden-yarrow, mustard, popcorn flower
5	Disturbed coastal sage scrub	blue dicks, California buckwheat, deerweed, long-stem golden-yarrow, mustard
6	Disturbed coastal sage scrub (below the high water mark for the reservoir) and high quality coastal sage scrub in the higher elevations	blue dicks, California buckwheat, deerweed, fiddleneck, long-stem golden-yarrow, mustard, onion, popcorn flower, snapdragon (*Antirrhinum* sp.) (NOT Coulter's snapdragon)
7	Eucalytus (*Eucalyptus* sp.) woodland	California buckwheat, mustard



Sweetwater Authority Filter Plant Expansion Project
Quino Checkerspot Butterfly (*Euphydryas editha quino*) Survey, 2004
Figure 1: Aerial Photo of Project Site

Please Note:

Image provided courtesy of Sweetwater Authority



Sweetwater Authority Filter Plant Expansion Project
Quino Checkerspot Butterfly (*Euphydryas editha quino*) Survey, 2004
Figure 2: Site Assessment

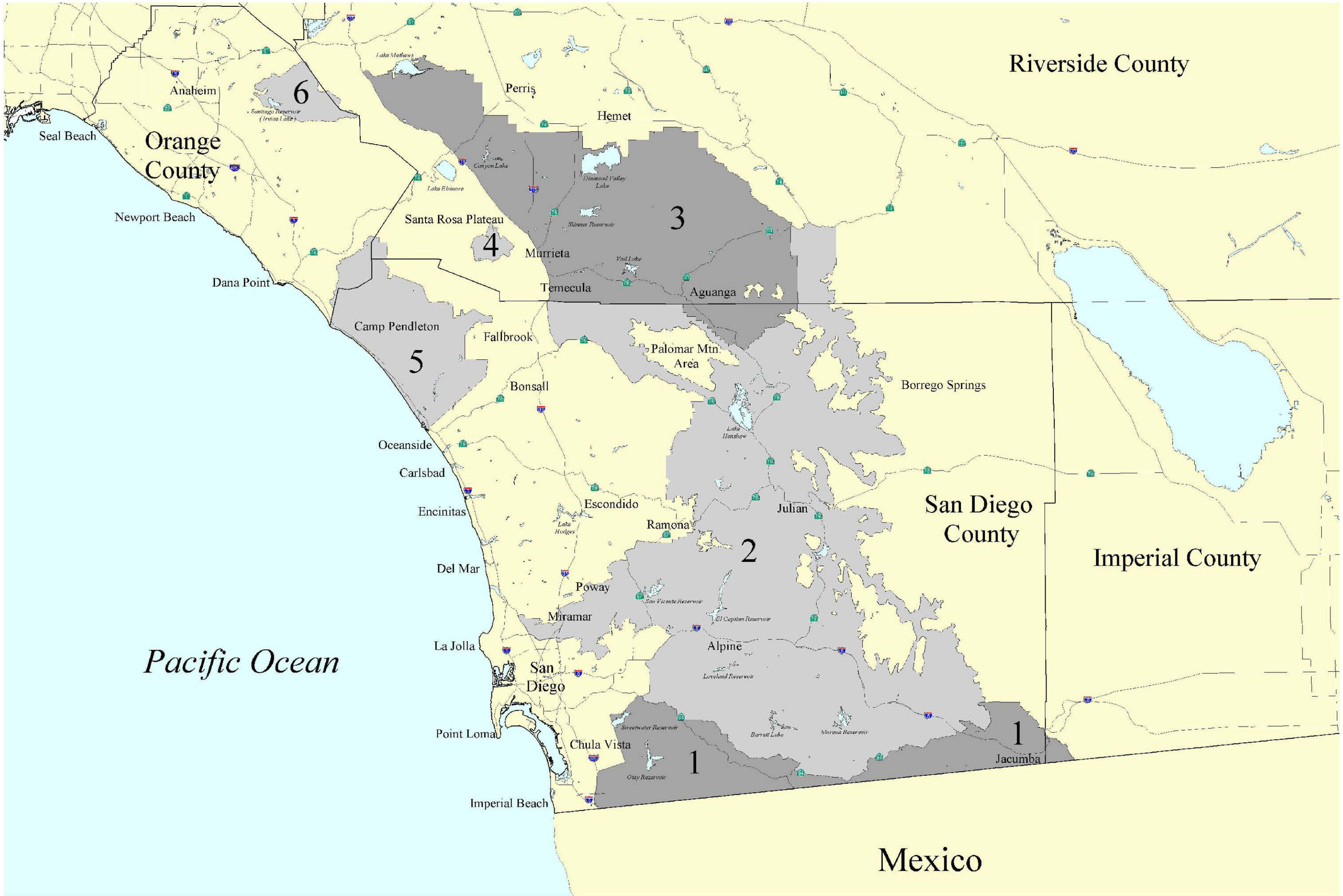
0 0.1 0.2mi

Sweetwater Authority Reservoir
Original Scale 1:24,000
UTM 11 499070E 3617042N
(WGS84/NAD83)
USGS **NATIONAL CITY** Quad

- Potential Quino Habitat
- Riparian Woodland
- Eucalyptus Woodland
- Urbanized/Steep

N

APPENDIX



Year 2002 Recommended Quino Survey Areas

20 0 20 40 Miles

80000 0 80000 160000 Feet

50000 0 50000 100000 Feet

Legend

YEAR 2002 RECOMMENDED SURVEY AREAS

SURVEY AREA - CAPTURE NOT ALLOWED

SURVEY AREA - LIMITED LIVE CAPTURE ALLOWED WITH RECOVERY PERMIT

N

DATA SOURCES:

BASE DATA - Teale Data Center, Sanding, ESRI, Hale Inc., USFWS, USFS, and Riverside County GIS

QUINO DATA - Year 2002 Recommended Quino Survey Areas USFWS based on staff biological staff input, data compiled from the above Base Data Sources.

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

From: Lara Reising [lreising@cox.net]
Sent: Thursday, April 22, 2004 1:19 PM
To: Alison_Anderson@r1.fws.gov
Subject: RE: Duration of Flight Season for QCB at Sweetwater Reservoir

Hello Alison,

I've now completed my 7th survey of the area west of the Sweetwater Reservoir, around the filter plant.

I have not detected QCB. I have also not seen plantago in the survey area. I know plantago is present and still in bloom within the SDNWR, east of the Sweetwater Reservoir. Therefore, I believe that if it was present within my survey area, I would have detected it by now. I have not detected owl's clover or the white snapdragon either. To give you a general feel for the status of the plants within my survey site, the commonly blooming *Lotus scoparius* looks to have reached it's peak bloom and is now forming seed. Other potential adult nectaring plants such as *Gnapthalium* sp. or *Amsinckia* sp. are still blooming. Other plant species in bloom include: *Viguiera laciniata*, *Encelia californica*, *Eriogonum fasciculatum*, *Allium* sp., *Dichelostema capitatum*, *Eriophyllum confertiflorum*, *Brassica* sp., *Erodium* sp., and *Calystegia macrostegia*.

So, I feel that there are adult nectaring plants available for QCB to utilize if they were present. However, because I have the plants (not the larval plants though) and not the QCB, I am lead to believe that QCB are not present within the survey area, as residents or as individuals moving through.

According to the web site and your email below, no QCB have been detected at the Rancho San Diego site (the closest monitored site to Sweetwater) either due to low population densities or extirpation. This supports the rational that QCB are probably not within the area around Sweetwater. In addition, the area around the filter plant has been subject to development and repeated disturbance, further decreasing the amount of available, suitable QCB habitat.

I feel that the survey area around the Sweetwater Authority filter plant has been sufficiently surveyed. I realize the protocol state that if QCB have not been detected within the first five surveys of a given area, surveys should continue throughout the flight season to increase the chances of detection. The flight season within my area is not clear as no QCB have been detected within the nearest reference site (Rancho San Diego). The next closest monitored site, Rancho Jamul, is approximately 10 miles away, at approximately 1,000 feet in elevation vs. approximately 300 feet at Sweetwater Reservoir. Rancho Jamul is also within a much less developed area, given the proximity of Highway 54 and encroaching residential developments at Sweetwater.

So, I need to ask again, would you say the flight season has come and gone for my survey area
or
should I continue to do surveys?

Thanks again,

Lara

-----Original Message-----
From: Alison_Anderson@r1.fws.gov [mailto:Alison_Anderson@r1.fws.gov]
Sent: Wednesday, April 07, 2004 10:56 AM
To: Lara Reising

Subject: Re: Duration of Flight Season for QCB at Sweetwater Reservoir

No, I would say the flight season has probably not ended yet based on what I know and what you told me. Fresh individuals were detected at Rancho Jamul March 30. No sitings at Rancho San Diego is probably due to a low density population, possibly extirpation.

Alison

"Lara Reising" <lreising@cox.net> 04/07/2004 01:17 AM

To: <Alison_Anderson@r1.fws.gov>
cc:
Subject: Duration of Flight Season for QCB at Sweetwater Reservoir

Hi Alison,

I'm wrapping up my 5th survey of the area west of the Sweetwater Reservoir, around the filter plant. I began my surveys on March 8, 2004. I have not detected any QCB. According to the website and protocol, I should continue surveying until the end of the flight season.

However, no QCB have been detected at the USFWS reference site (SDNWR-the closest monitored site) and it also sounds like the peak flight time has passed for those areas below 3000 feet.

Would you say the flight season has come and gone for my survey area or should I continue to do surveys?

Thanks in advance for your advice.

Lara T. Reising

PS, please confirm that you have received this email. Thanks-

From: Lara Reising [lreising@cox.net]
Sent: Wednesday, April 07, 2004 4:43 PM
To: Alison_Anderson@r1.fws.gov
Subject: RE: Duration of Flight Season for QCB at Sweetwater Reservoir

Thanks Alison

-----Original Message-----
From: Alison_Anderson@r1.fws.gov [mailto:Alison_Anderson@r1.fws.gov]
Sent: Wednesday, April 07, 2004 10:56 AM
To: Lara Reising
Subject: Re: Duration of Flight Season for QCB at Sweetwater Reservoir

No, I would say the flight season has probably not ended yet based on what I know and what you told me. Fresh individuals were detected at Rancho Jamul March 30. No sitings at Rancho San Diego is probably due to a low density population, possibly extirpation.

Alison

"Lara Reising" <lreising@cox.net> 04/07/2004 01:17 AM

To: <Alison_Anderson@r1.fws.gov>
cc:
Subject: Duration of Flight Season for QCB at Sweetwater Reservoir

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However, no QCB have been detected at the USFWS reference site (SDNWR-the closest monitored site) and it also sounds like the peak flight time has passed for those areas below 3000 feet.

Would you say the flight season has come and gone for my survey area or should I continue to do surveys?

Thanks in advance for your advice.

Lara T. Reising

PS, please confirm that you have received this email. Thanks-

From: Lara Reising [lreising@cox.net]
Sent: Wednesday, April 07, 2004 1:18 AM
To: Alison_Anderson@r1.fws.gov
Subject: Duration of Flight Season for QCB at Sweetwater Reservoir

Hi Alison,

I'm wrapping up my 5th survey of the area west of the Sweetwater Reservoir, around the filter plant. I began my surveys on March 8, 2004. I have not detected any QCB. According to the website and protocol, I should continue surveying until the end of the flight season.

However, no QCB have been detected at the USFWS reference site (SDNWR-the closest monitored site) and it also sounds like the peak flight time has passed for those areas below 3000 feet.

Would you say the flight season has come and gone for my survey area or should I continue to do surveys?

Thanks in advance for your advice.

Lara T. Reising

PS, please confirm that you have received this email. Thanks-

March 23, 2004

Daniel Marquez
United States Fish and Wildlife Service
6010 Hidden Valley Road
Carlsbad, California
92009-4219

Dear Mr. Marquez:

This letter will serve as a written notification that protocol level surveys have commenced for the Quino checkerspot butterfly (*Euphydryas editha quino*) (QCB) at the Sweetwater Authority filter plant located at 100 Lakeview Avenue, Spring Valley, California. Please see the attached figures for reference.

I had discussed the potential initiation of surveys with Allison Anderson (USFWS) in late February 2004, prior to the flight season. On March 1, 2004 I conducted the bioassessment of the project area. I intend to include a summary of this information along with the report of the surveys within the 45-day period after the cessation of the surveys.

On March 4, 2004, QCB were detected by the USFWS at the Marron Valley and Lake Skinner survey areas. I initiated protocol level surveys at Sweetwater Authority on the following Monday, March 8, 2004. Since that time, I have performed surveys of the site on March 9, 15, and 16, 2004. As of yet, I have not been able to complete the third survey of the site during the week of March 22 due to inclement weather. I intend to perform the third survey of the site on March 24, 2004.

I apologize for not providing prior written notification. The required timeline for the notification of survey activities was not clear to me from my permit. I have been in contact with Ms. Anderson throughout this field season for guidance and support. On March 22, 2004, she informed me know that I should have notified you prior to initiating surveys. Again, I apologize for the delay. Please contact me at 858-774-0781 if you have any questions or concerns.

Sincerely,

Lara T. Reising
Permit Number TE-039161-0

ATTACHMENT 2

Rare Plant Survey Report. McMillan Biological Consulting. January 7, 2005

McMILLAN BIOLOGICAL CONSULTING
P. O. Box 4137
La Mesa, CA 91941
Ph# (619) 368-9508
Fx# (619) 469-1698
Email: smcmillan@cox.net

January 7, 2005

Sweetwater Authority
100 Lakeview Ave.
Spring Valley, CA 91977

SUBJECT: Rare Plant and General Botanical Surveys on the Sweetwater Reservoir Purdue Plant Expansion Project

Introduction

During the 2004 spring season, McMillan Biological Consulting (MBC) conducted rare plant and general botanical surveys on the Purdue Plant Expansion Project. In summary, these surveys were conducted on approximately 35 acres surrounding the current Purdue Plant filtration facility. These surveys were conducted on a combination of landscaped areas, ruderal areas and native habitat areas. Native areas surveyed included coastal sage scrub habitat, with inclusions of native grassland and clay lens habitat, and riparian habitat.

A general plant species list and account was complied by all surveying biologist, and vegetation mapping and description was conducted by Sweetwater Reservoir biologist Pete Famolaro. This report is a summary of the rare plant surveys conducted by biologist Scott McMillan and this report also includes recommendations for future botanical survey efforts.

Survey Methods and Dates

The entire survey area (approximately 35 acres) was walked at least three times during the spring and early summer of the 2004 season (see Figure 1). Surveys were performed over several months to determine presence of sensitive plants with varying periods of detectability. For instance, some earlier flowering species may not be detectable with surveys conducted later in the spring. Conversely, plants that flower in late spring may not be identifiable during earlier season surveys. Surveys results may have been limited due to relatively low rainfall of the 2004-2005 rainy season which may have affected recruitment and/or detectability of some species. All sensitive plant survey work was conducted by biologist Scott McMillan. Pete Famolaro complimented rare plant data where some species accounts were recorded incidental to other field work.

Surveys were conducted on the following dates:

February 15
March 4, 18, 19
April 5, 12
May 8, 25

Figure 1:
Rare Plants Identified

Rare plants - perdue expansion.shp

- **Ferocactus viridescens**
- **Harpagonella palmeri**
- **Selaginella cinerascens**
- **Adolphia californica**
- **Project area.shp**

Data Sources: McMillan Biological Consulting and Sweetwater Authority

200 0 200 400 600 Feet

N

McMillan Biological Consulting

SWEETWATER AUTHORITY

TABLE 1
SENSITIVE PLANT SPECIES PRESENT OR WITH POTENTIAL TO OCCUR IN THE PURDUE PLANT EXPANSION AREA, SPRING 2004

Species	State/Federal Status	CNPS List/Code	Habitats
*Acanthomintha ilicifolia** San Diego thornmint	CE/FT	1B/2-3-2	GL
Adolphia californica California adolphia	--/--	2/1-2-1	CSS
*Ambrosia pumilla** San Diego Ambrosia	FE/--	1B/3-3-2	GL, NNG
*Artemisia palmeri** San Diego sagewort	--/--	4/1-2-1	R
*Convolvulus simulans** Small-flowered morning-glory	--/--	4/1-2-2	GL, NNG
Dienandra conjugens (*Hemizonia c.*)* Otay tarplant	CE/FT	1B/3-3-2	GL, NNG
*Dudleya variegata** Variegated dudleya	--/--	1B/2-2-2	CSS, GL
Ericameria palmeri ssp. *palmeri** Palmer's goldenbush	--/--	2/3-2-1	R
Ferocactus viridescens San Diego barrel cactus	--/--	2/1-3-1	CSS, GL
Harpagonella palmeri Palmer's grapplinghook	--/--	2/1-2-1	GL
*Iva hayesiana** San Diego marsh-elder	--/--	2/2-2-1	R
Juncus acutus ssp. *leopoldii** Southwestern spiny rush	--/--	4/1-2-1	R
*Muilla clevelandii** San Diego goldenstar	--/--	1B/2-3-2	GL
Opuntia californica var. *californica** Snake cholla	--/--	1B/3-3-2	CSS

TABLE 1, Continued
SENSITIVE PLANT SPECIES PRESENT OR WITH POTENTIAL TO OCCUR IN THE PURDUE PLANT EXPANSION AREA, SPRING 2004

Species	State/Federal Status	CNPS List/Code	Habitats
Selaginella cinerascens Ashy spike-moss	--/--	4/1-2-1	CSS, GL
Viguiera laciniata San Diego sunflower	--/--	4/1-2-1	CSS, GL

* Not found during the 2004 field surveys

NOTE: See Table 2 for explanation of sensitivity codes.

Habitat Codes:
CSS = Coastal Sage Scrub
GL = Native Grassland/Disturbed Clay Lens
NNG = Non-Native Annual Grassland
R = Riparian or Mesic Meadow

TABLE 2
SENSITIVITY CODES

FEDERAL CANDIDATES AND LISTED PLANT SPECIES

FE = Federally listed, endangered
FT = Federally listed, threatened
FPE = Federally proposed endangered
FPT = Federally proposed threatened

STATE LISTED PLANT SPECIES

CE = State listed, endangered
CT = State listed, threatened
CR = State listed, rare

CALIFORNIA NATIVE PLANT SOCIETY

LISTS

1A = Species presumed extinct.

1B = Species rare, threatened, or endangered in California and elsewhere.

2 = Species rare, threatened, or endangered in California but which are more common elsewhere. These species are eligible for state listing..

3 = Species for which more information is needed. Distribution, endangerment, and/or taxonomic information are needed.

4 = A watch list of species of limited distribution. These species need to be monitored for changes in the status of their populations.

R-E-D CODES

R (Rarity)

1 = Rare, but found in sufficient numbers and distribution widely enough that the potential for extinction is low at this time.

2 = Occurrence confined to several populations or to one extended population.

3 = Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported.

E (Endangerment)

1 = Not endangered
2 = Endangered in a portion of its range
3 = Endangered throughout its range.

D (Distribution)

1 = More or less widespread outside California
2 = Rare outside California
3 = Endemic to California

Sensitive Plant Species Accounts

A total of 5 sensitive plant species occurred in the survey area (Figure 1 ; Table 1). In addition, 11 sensitive plant species with potential to occur are discussed.

Acanthomintha ilicifolia – San Diego thornmint (Not Found During the 2004 Season)
Federal Status: FT State Status: CE CNPS List/Code: 1B/2-3-2
San Diego thornmint is an annual herb that occurs in heavy clay soils associated with native grasslands, coastal sage scrub, chaparral, and vernal pools. This herb blooms between April and July and is found from northern San Diego County south to northwestern Baja California, Mexico. This species is found in the open heavy clay soil areas, often associated with other clay species like Otay tarplant, small-flowered morning-glory, and Palmer's grappling hook. Although San Diego thornmint was not found during the 2004 survey season, there are heavy clay soil areas with open habitat where San Diego thornmint could potentially occur. The clay soil habitat, the known populations near the project area, and the low rainfall amounts during the 2004 season, indicate the need for additional surveys during a spring season with a more normal rainfall amount (see Summary and Recommendations, below).

Adolphia californica – California Adolphia
Federal Status: -- State Status: -- CNPS List/Code: 2/1-2-1
This spiny shrub usually flowers in the spring and summer and is found in coastal sage scrub, chaparral and grassland habitats throughout the coastal mesas and foothills of San Diego County and northern Baja California, Mexico. This species is associated with heavy clay soils and is located in patches along the west-facing slope along the western portion of the project boundary (Figure 1). These patches extend down slope off Sweetwater Reservoir property. Remnant clumps of this species are scattered in the understory of the Eucalyptus woodland along the slope of the survey area.

Ambrosia pumilla – San Diego Ambrosia (Not Found During the 2004 Season)
Federal Status: FE State Status: -- CNPS List/Code: 1B/3-3-2
This rhizomatous perennial herb blooms from April to September and occurs in a limited number of localities in Riverside and San Diego Counties, as well as northwestern Baja California, Mexico. This species often occurs in the flood plain terraces and can reproduce vegetatively. San Diego Ambrosia was not found during the 2004 survey season, and the survey area does not have any areas that are typical for San Diego Ambrosia habitat, but the low rainfall amounts during the 2004 season make it difficult to eliminate as a species with potential to occur. It is recommended that additional surveys be conducted during a spring season with a more normal rainfall amount (see Summary and Recommendation, below).

Artemisia palmeri – San Diego sagewort (Not Found During the 2004 Season)
Federal Status: -- State Status: -- CNPS List/Code: 4/1-2-1
This shrub species blooms from May to September and occurs in the riparian woodlands and other mesic habitats (e.g. mesic meadows). This species usually occurs in the flood plain and upper slopes of drainages in San Diego County and northwestern Baja California, Mexico. San Diego sagewort was not found during the 2004 survey season. The only suitable habitat for San Diego sagewort in the survey area is just below the dam, but this small area of riparian habitat was well surveyed during the 2004 season. Even though there was low rainfall amounts during the 2004 season, this species would most likely have been evident if it occurred in the survey area.

Convolvulus simulans – Small-flowered morning-glory (Not Found During the 2004 Season)
Federal Status: -- State Status: -- CNPS List/Code: 2/1-2-1
A small-flowered annual that blooms in the early to late spring and is found from Contra Costa county south into northwestern Baja California, Mexico. This species is found in the open clay soils associated with coastal sage scrub, chaparral, and grassland habitats. Although small-flowered morning-glory was not found during the 2004 survey season, there are heavy clay soil areas with open habitat where small-flowered morning-glory could potentially occur. The clay soil habitat, the known populations near the project area, and the low rainfall amounts during the 2004 season, indicate the need for additional surveys during a spring season with a more normal rainfall amount (see Summary and Recommendations, below).

Dienandra conjugens (*Hemizonia c.*) – Otay tarplant (Not Found During the 2004 Season)
Federal Status: FT State Status: CE CNPS List/Code: 1B/3-3-2
This annual tarplant is listed as threatened by the U. S. Fish and Wildlife Service (USFS) and endangered by the California Department of Fish and Game (CDFG). This species is restricted to southern San Diego County and a few areas in Baja California, Mexico. This species is associated with certain heavy clay soils common in the South-Bay area. Populations of this species can fluctuate dramatically from year to year, so accurate population counts and localities can be difficult to determine. Although Otay tarplant was not found during the 2004 survey season, there are heavy clay soil areas with open habitat where Otay tarplant could potentially occur. The clay soil habitat, the known populations near the project area, and the low rainfall amounts during the 2004 season, indicate the need for additional surveys during a spring season with a more normal rainfall amount (see Summary and Recommendations, below).

Dudleya variegata – Variegated Dudleya (Not Found During the 2004 Season)
Federal Status: -- State Status: -- CNPS List/Code: 1B/2-2-2
Variegated Dudleya is a cormose perennial that flowers in the spring to early summer in the coastal zone of San Diego County and northwestern Baja California, Mexico. This species is found in clay soils associated with the coastal sage scrub, chaparral. grassland and vernal pools habitats. Although variegated Dudleya was not found during the 2004 survey season, there are rocky clay soil areas with open habitat where variegated Dudleya could potentially occur. The rocky clay soil habitat, the known populations near the project area, and the low rainfall amounts during the 2004 season, indicate the need for additional surveys during a spring season with a more normal rainfall amount (see Summary and Recommendations, below).

Ericameria palmeri ssp. *palmeri* – Palmer's goldenbush (Not Found During the 2004 Season)
Federal Status: -- State Status: -- CNPS List/Code: 2/3-2-1
This evergreen shrub flowers from June to November and is known from only six occurrences. This species is found in the chaparral, coastal sage scrub and mesic habitats. Although this species is known from populations near the project area and there were low rainfall amounts during the 2004 season, this species would most likely have been evident if it occurred in the survey area.

Ferocactus viridescens – San Diego barrel cactus
Federal Status: -- State Status: -- CNPS List/Code: 2/1-3-1
This cactus species is found in the coastal zone of central and southern San Diego County and northwestern Baja California, Mexico. This species flowers in the spring to early summer and occurs in rocky and clays soils associated with the coastal sage scrub and maritime succulent scrub, as well as chaparral and grassland habitats. Numerous populations were found in the survey area, especially along the western boundary of the project area, along the steep cliffs overlooking the dam, and in the understory of the coastal sage scrub area in the eastern portion of the project area (Figure 1).

Harpagonella palmeri – Palmer's grapplinghook
Federal Status: -- State Status: -- CNPS List/Code: 2/1-2-1
Palmer's grapplinghook is a small-flowered annual with hooked-tipped fruits. This annual flowers in the early to late spring and occurs in San Diego County and northwestern Baja California, Mexico. This species is associated with the heavy clay soils common to Otay tarplant and San Diego Thornmint (*Acanthomintha ilicifolia*). One population of this species was found just outside the western edge of the survey area (Figure 1). This population consisted of approximately 100 individuals and although the habitat extended into the survey areas, it was only found to the west.

Iva hayesiana – San Diego marsh-elder
Federal Status: -- State Status: -- CNPS List/Code: 2/2-2-1
San Diego marsh-elder is found in San Diego County and northern Baja California, Mexico. This subshrub species occurs in variety of riparian habitats and flowers in the spring and summer. The only suitable habitat for San Diego marsh-elder in the survey area is just below the dam, but this small area of riparian habitat was well surveyed during the 2004 season. Even though there was low rainfall amounts during the 2004 season, this species would most likely have been evident if it occurred in the survey area.

Juncus acutus ssp. *leopoldii* – Southwestern spiny rush (Not Found During the 2004 Season)
Federal Status: -- State Status: -- CNPS List/Code: 4/1-2-1
This species occurs in southern California and northwestern Baja in mesic meadows, seeps, alkaline flats, and coastal salt marsh habitats. Southwestern spiny rush is a rhizomatous perennial that flowers in the spring and early summer. The only suitable habitat for Southwestern spiny rush in the survey area is just below the dam, but this small area of riparian habitat was well surveyed during the 2004 season. Even though there was low rainfall amounts during the 2004 season, this species would most likely have been evident if it occurred in the survey area.

Muilla clevelandii – San Diego goldenstar (Not Found During the 2004 Season)
Federal Status: -- State Status: -- CNPS List/Code: 1B/2-3-2
San Diego goldenstar is a perennial bulb that occurs in grassland and clay lens habitats associated with coastal sage scrub, chaparral, and vernal pool areas in San Diego County and northwest Baja California, Mexico. This species flowers between the months of April and June and is usually associated with clay soils on the coastal mesas and foothill slopes. Although San Diego goldenstar was not found during the 2004 survey season, there are rocky clay soil areas with open habitat where San Diego goldenstar could potentially occur. The rocky clay soil habitat, the known populations near the project area, and the low rainfall amounts during the 2004 season, indicate the need for additional surveys during a spring season with a more normal rainfall amount (see Summary and Recommendations, below).

Opuntia californica var. *californica* - Snake cholla (Not Found During the 2004 Season)
Federal Status: -- State Status: -- CNPS List/Code: 1B/3-3-2
Snake cholla is a prostrate cactus found in coastal sage and maritime succulent scrub habitats. The species is known to few locations from southwestern San Diego County to northern Baja California, Mexico. Snake cholla could potentially occur within coastal sage scrub habitat on-site, particularly in more exposed south and west facing slopes. Given the level of survey coverage of these areas, the species most likely would have been found had it been present.

Selaginella cinerascens – Ashy spike-moss
Federal Status: -- State Status: -- CNPS List/Code: 4/1-2-1
Ashy spike-moss is a non-flowering plant that occurs on dry exposed soils within the coastal sage scrub, chaparral and grassland habitats in Orange County, San Diego County and northwestern Baja California, Mexico. This species was primarily found in the understory of the coastal sage scrub in the eastern portion of the survey area (Figure 1).

Viguiera laciniata – San Diego sunflower
Federal Status: -- State Status: -- CNPS List/Code: 4/1-2-1
This flowering shrub occurs in the coastal sage scrub and chaparral in San Diego County and northern Baja California, Mexico. San Diego Sunflower blooms in the spring and summer and is found throughout the survey area, especially on the north side of the dam. This species was not mapped, as it is a common component throughout much of the survey area, especially on the south-facing slopes.

Summary and Recommendations

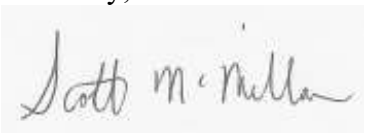
Sensitive plant surveys were conducted on approximately 35 acres surrounding the current Purdue Filtration Plant at Sweetwater Reservoir. These surveys were conducted on ruderal, landscaped, and native habitats. The native habitats including coastal sage scrub, native grassland/clay lens, and riparian vegetations.

A total of 5 sensitive species were found during the 2004 season (California Adolphia, San Diego barrel cactus, Palmer's grappling hook, ashy spike-moss, and San Diego sunflower), as well as the potential for 11 other sensitive species (San Diego thornmint, San Diego Ambrosia, San Diego sagewort, small-flowered morning-glory, Otay tarplant, variegated Dudleya, Palmer's goldenbush, San Diego marsh-elder, southwestern spiny rush, San Diego goldenstar, and snake cholla).

Due to the low rainfall amounts during the 2004 season, it possible that some species did not come up in 2004, or came up in only small portions of their occurrence. In addition, the ten species discussed with potential to occur are all known to occur in at least one population near the survey area. These two factors indicate the need for additional surveys in a season that has had adequate to normal rainfall amounts. Additional surveys in a wet season will not only improve the quality of the surveys for the potential species, but will also insure that the species mapped in 2004 have been adequately covered (i.e. Palmer's grappling hook).

If you have any questions regarding the field work or this report, please contact me by phone at 619-368-9508, or by email at smcmillan@cox.net.

Sincerely,



Scott McMillan

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ATTACHMENT 3

Updated Rare Plant Survey Report. McMillan Biological Consulting. June 30, 2005

McMILLAN BIOLOGICAL CONSULTING
P. O. Box 4137
La Mesa, CA 91941
Ph# (619) 368-9522
Email: brmcmillan@cox.net

June 30, 2005

Sweetwater Authority
100 Lakeview Ave.
Spring Valley, CA 91977

SUBJECT: Updated Rare Plant and General Botanical Surveys on the Sweetwater Reservoir Perdue Plant Expansion Project

Introduction

During the 2005 spring season, McMillan Biological Consulting (MBC) conducted rare plant and general botanical surveys on the Perdue Plant Expansion Project. In summary, these surveys were conducted on approximately 35 acres surrounding the current Perdue Plant filtration facility. These surveys were conducted on a combination of landscaped areas, ruderal areas and native habitat areas. Native areas surveyed included coastal sage scrub habitat, native grassland and clay lens habitat, and non-native grassland habitat.

A general plant species list and accounts were complied by the surveying biologist, and vegetation mapping and description was conducted by Sweetwater Reservoir biologist Pete Famolaro. This letter report is a summary of the rare plant and vegetation surveys conducted by McMillan Biological Consulting.

Survey Methods and Dates

The entire survey area (approximately 35 acres) was walked at least three times during the spring and early summer of the 2005 season. All sensitive plant survey work was conducted by biologist Brenda McMillan.

Surveys were conducted on the following dates during the 2005 season:

March 2, 9, 31
April 7, 13, 20
June 7, 12

Summary and Conclusions

The 2004 season was a drier than average year, and because of this, it was determined that additional botanical surveys were required to insure that no sensitive plant species occur within the project area. The 2005 season was the third wettest year on record and should have provided excellent conditions for all of the potential sensitive plant species found in and around the Sweetwater Reservoir property.

Surveys were conducted on ruderal, landscaped, and native habitats. The native habitats include coastal sage scrub and native grassland/clay lens. All vegetation mapping done during the 2004 season was checked and confirmed for area and type, and no changes were made to vegetation assessment from the 2004 report.

Sensitive plant species surveys were conducted during the 2005 season on all 35 acres of the project area, and even though the 2005 season was much wetter than averages, there was no new data to add to the 2004 season survey data. There were no new populations of sensitive plant species found, and estimated numbers from the 2004 season remain accurate.

If you have any questions regarding the surveys or this report, please contact me by phone at 619-368-9522, or by email at brmcmillan@cox.net.

Sincerely,

Brenda McMillan

Brenda McMillan

Aquatic Resource Delineation Report

Sweetwater Reservoir Aeration and Destratification Project

AQUATIC RESOURCE DELINEATION REPORT

SWEETWATER RESERVOIR
AERATION AND DESTRATIFICATION PROJECT
SAN DIEGO, CA
WSP PROJECT NO. 2355502002

Prepared for:

SWEETWATER AUTHORITY

Israel Marquez

JULY 2024

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ACRONYMS AND ABBREVIATIONS

‘	Feet
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CWA	Clean Water Act
FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
JD	Jurisdictional determination
NWI	National Wetland Inventory
OBL	Obligate Wetland
Perdue WTP	Robert A. Perdue Water Treatment Plant
RWQCB	Regional Water Quality Control Board
SWA	Sweetwater Authority
UPL	Upland
USACE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
WSP	WSP USA Environment & Infrastructure Inc.
WUS	Waters of the United States

1 INTRODUCTION

WSP USA Environment & Infrastructure, Inc. (WSP) was contracted by the Sweetwater Authority (SWA) to identify potentially jurisdictional aquatic resources for the Sweetwater Reservoir Aeration and Destratification Project at the Sweetwater Reservoir in San Diego County, California.

1.1 PURPOSE OF THE REPORT

This report presents regulatory framework, methods, and results of a delineation of potentially jurisdictional aquatic resources in the project area. This delineation report was prepared at the request of SWA, a public water agency, to fulfill project permit application requirements by federal and state permitting agencies.

1.2 PROJECT LOCATION

The proposed Aeriation and Destratification System is located at the Robert A. Perdue Water Treatment Plant (Perdue WTP) at the western limits of the Sweetwater Reservoir (Figure 1). The Sweetwater Reservoir is located south of the community of Spring Valley in southwestern San Diego County, California (Figure 2). The site lies within the Jamacha Land Grant on the U.S. Geological Survey (USGS) topographic map (Figure 3) with the approximate centerpoint of the project area at 32.69281° North latitude and -117.00701° West longitude.

1.3 PROJECT DESCRIPTION

Sweetwater Reservoir is a nutrient-rich, biologically productive lake which undergoes thermal stratification during the spring and summer months allowing nutrients and other oxidized compounds sequestered in the sediment to re-enter the water column, fueling a cycle of algal productivity and other water quality challenges. During the fall, surface water temperatures cool, causing a re-circulation of the nutrients, iron, manganese, sulfides, and total organic carbon from the lower reaches of the reservoir throughout the water column, which can make the water entering the Perdue WTP very difficult and, at times, impossible to treat.

A previous aeration system was installed in 1978, adjacent to the Sweetwater Dam, which hasn't been operated since 2001 and is no longer in service. The previous aeration system had an air compressor located in a building just north of the Sweetwater Dam. This previous aeration system had the tendency to stir up sediment in the area between the intake tower and the dam's log boom, which would cause short-term water quality issues at the Perdue WTP. Revisions to the design will produce a more effective aeriation system that will help to improve water quality in the Reservoir.

The proposed aeration system, which consists of air compressors feeding a diffuser line attached to a buoyant air pipeline anchored just above the bottom of the reservoir (Figure 1), would de-stratify the water column with an upward stream of air bubbles. This vertical mixing and aeration will improve the water quality in the reservoir. The current condition of the Sweetwater Reservoir is listed in the 303(d)(1) list for Mercury (129462) and Dissolved Oxygen (69024) (State Water Resourced Control Board 2023). The aeration system is designed to improve water quality, including Dissolved Oxygen, and the installation of the aeration system is intended to help delist the reservoir from the 303(d)(1) list for Dissolved Oxygen.

The aeration system consists of a 2,590-foot-long air diffuser line, including 1-, 3-, 4-, and 10-inch pipes, connected to two 75-horsepower air compressors. The underwater portion of the diffuser line would be anchored by concrete structures set at the bottom of the reservoir and tethered to the line by stainless steel cables as shown in the schematic below. The air compressors will be set up behind a retaining wall near the existing Perdue WTP buildings at the northwest corner of the reservoir (Figure 4, 5 and 6). Site photographs are included in Appendix A.

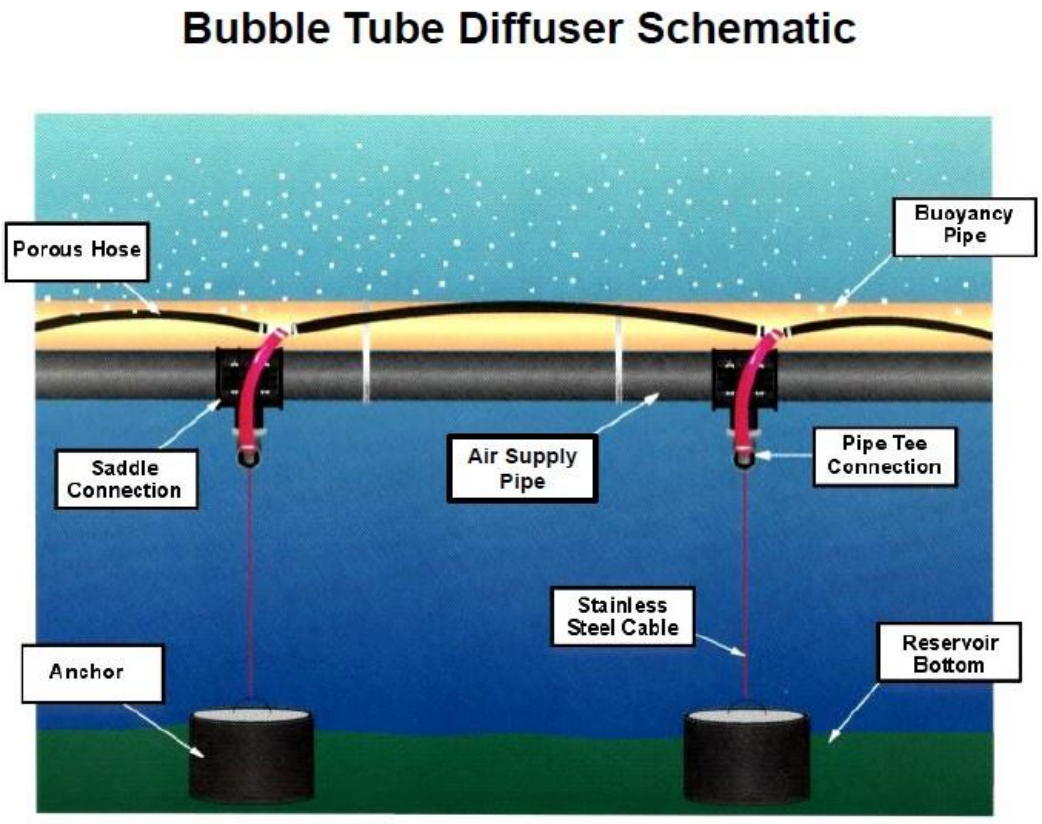
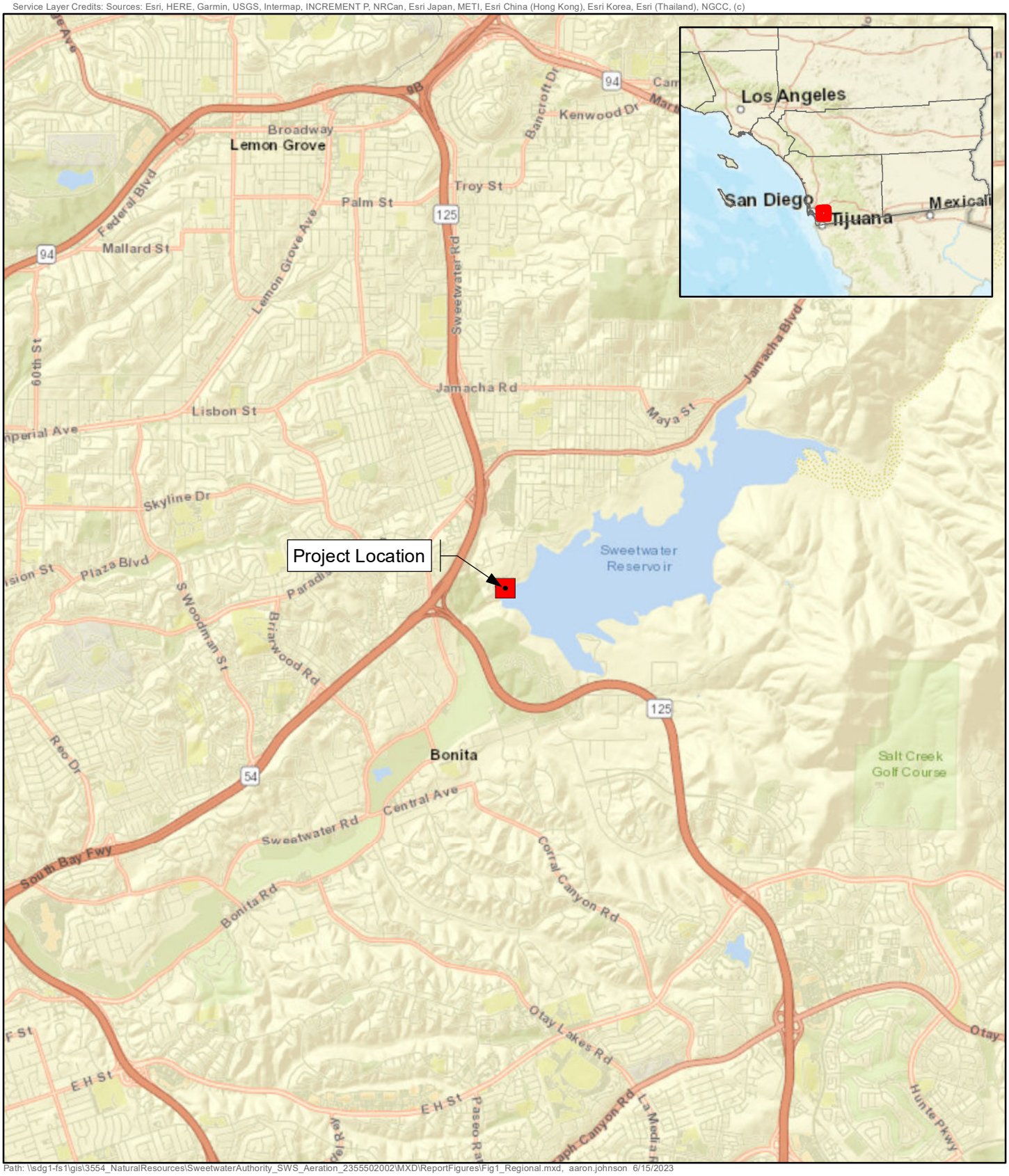


Figure 1: Bubble Tube Diffuser Schematic

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c)



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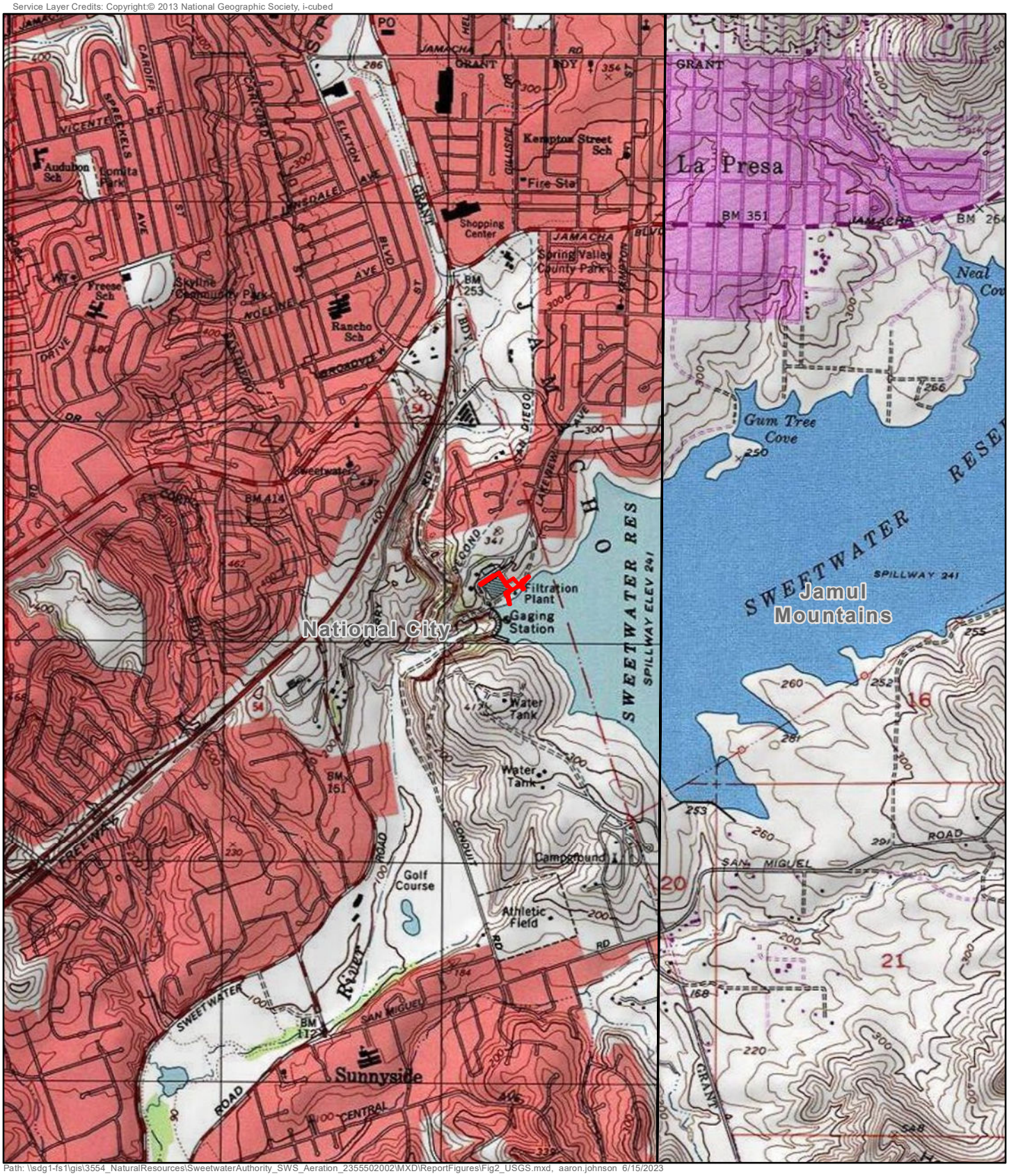
1 inch = 1 miles
0 0.5 1 Miles

FIGURE 1

Project Location
Aeration and Destratification Project
Sweetwater Authority
San Diego, CA

Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed



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1 inch = 2,000 feet

0 1,000 2,000 Feet

Project Location

USGS 24k Topo Map Boundaries

FIGURE 2

USGS 7.5' Quad: National City
Aeration and Destratification Project
Sweetwater Authority
San Diego, CA

Aeration Pipe and Related Features
Compressor Facility
Retaining Wall
Study Area
239-foot High Water Mark / U.S. Water Boundary

1 inch = 500 feet
0 250 500 Feet

FIGURE 4

Project Vicinity and Features
Aeration and Destratification Project
Sweetwater Authority
San Diego, CA

Figure 5. Project area along Reservoir shoreline facing north.

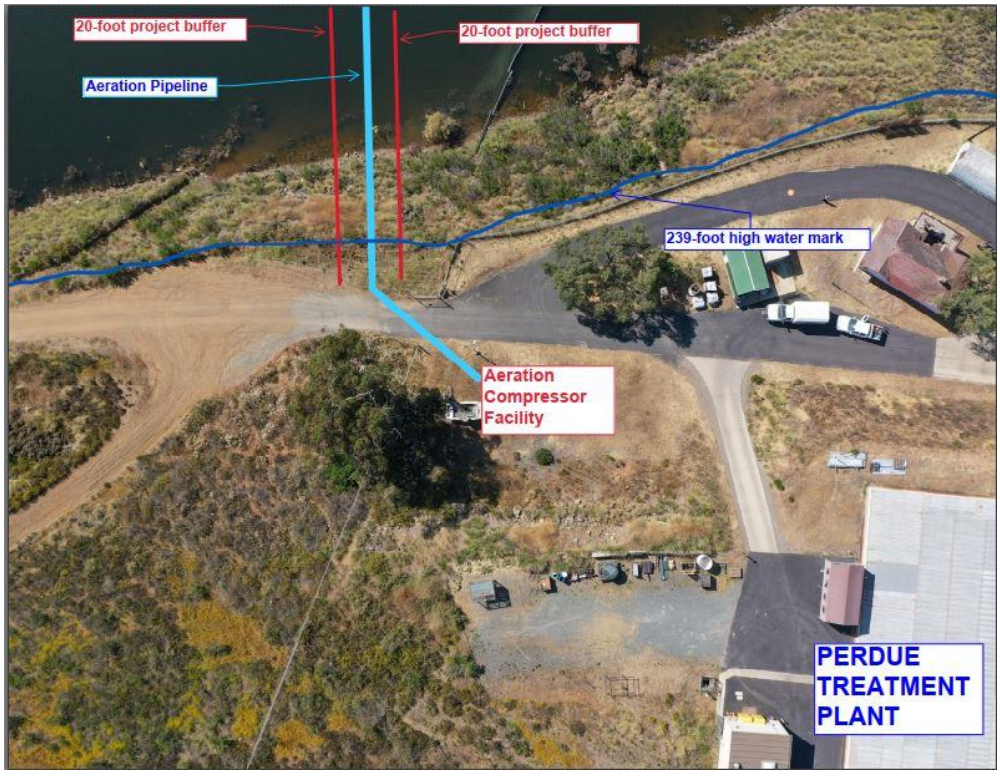

Figure 6. Project area along Reservoir shoreline facing South

1.4 JURISDICTIONAL DETERMINATION STUDY AREA

The study area for this aquatic resource, or jurisdictional determination (JD), is defined at the aeration pipeline alignment plus 20-foot buffer areas on either side of the pipe (Figures 4, 5, and 6). The total study area is approximately 2.38 acres.

1.5 SITE CONDITIONS

1.5.1 HYDROLOGY

The project lies in the Sweetwater River Watershed which encompasses approximately 230 square miles and includes the Sweetwater Reservoir and the Loveland Reservoir, which lies 17 miles upstream of the Sweetwater Reservoir.

Seasonally, in the winter and spring months, the Sweetwater River flows into the Sweetwater Reservoir from natural runoff and periodically from water transfers from Loveland Reservoir. Incoming water is held by Sweetwater Dam. The capacity of the Sweetwater Reservoir is approximately 28,079-acre feet of water and extends to 239 feet (') above mean sea level with the elevation of the dam spillway at the western edge of the reservoir (Figure 4, 5, and 6).

Annual rainfall in the area (measured from 1990 to 2019) averages 11.15 inches as registered at the El Cajon Station (U.S. Department of Agriculture [USDA] 2020 from SWA 2020).

From the Sweetwater Dam water flows approximately 8.3 miles west through the Sweetwater River before discharging into San Diego Bay.

The Sweetwater Reservoir water level is highly variable. Water level increases are dependent local rainfall runoff, water transfers from Loveland Reservoir, and/or direct input of water from regional water via the San Diego County Water Authority aqueduct. Water level drops or decreases happen while water is pumped for drinking water treatment at the Perdue WTP and due to evaporation.

1.5.2 SOILS

Soils identified in the USDA (2023a) Soil Survey within the JD study area include "Water" within the boundaries of the Reservoir and San Miguel rocky silt loam, 9 to 30 percent slopes along areas upland of the Reservoir. The San Miguel soil is not listed as a hydric soil in San Diego County (USDA 2023b).

1.5.3 VEGETATION

Vegetation and land covers within the JD study area include primarily unvegetated, open water within the Reservoir. However, there is peripheral wetland vegetation that can occur along a variable shoreline (i.e. below the 239' highwater mark of the reservoir within the JD study area) that could be described as opportunistic, reservoir level dependent vegetation. It would be characterized as a disturbed vegetation community given species composition. Predominant species in the exposed area of the reservoir and within the JD study area currently include broom baccharis (*Baccharis sarothroides*), mustard (*Brassica nigra* or *Brassica rapa*), purple fountain grass (*Pennisetum setaceusm),* castor bean (*Ricinus communis*), and salt cedar (*Tamarix* sp.). Only a few salt cedar occurred in the actual water within the JD study area, which is not uncommon in the greater Reservoir area. Other less

common weedy plant species in the JD study area include: nutsedge (*Cyperus* sp.), stinkwork (*Dittrichia graveolens*), western marsh cudweed (*Gnaphalium palustre*), salt heliotrope (*Heliotropium curassavicum*), cheeseweed mallow (*Malva parviflora*), white nightshade (*Solanum* sp.), sowthistle (*Sonchus* sp.), rod wirelettuce (*Stephanomeria virgate*), and prostate vervain (*Verbena bracteata*).

1.5.4 NATIONAL WETLANDS INVENTORY

The United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) identifies wetlands and deepwater habitat with descriptions based on the Cowardin Classification System (Cowardin et. al. 1979). The NWI is used for management, research, policy development, education, and planning activities, but are not used to determine regulatory authority.

NWI wetlands mapped in the project area (USFWS 2023) include Lacustrine, Littoral, Emergent, Non-persistent, Semi-permanently Flooded, and Diked/Impounded (L2EM2Fh) areas along the edge of the reservoir, and Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded (L1UBHh) areas within the open water portions of the reservoir. NWI areas are generally mapped accurately within the project area.

1.5.5 EXISTING LAND USE

Per the current County of San Diego data, land use mapping for the project area includes "communications and utilities", "open space park/preserve", and "lake large pond". The project mechanical facilities are located near the already developed and operational Perdue WTP, and the proposed aeration piping system occurs above and below the high-water boundary (239') of the Sweetwater Reservoir (Figure 4). The project will involve construction of facilities mostly above the 239' boundary, near the Perdue WTP, with diffuser pipes extending below the 239' boundary approximately 2,375 linear feet into the reservoir (Figure 4).

2 REGULATORY SETTING

There are three primary agencies that regulate activities within jurisdictional waters in California: the United States Army Corps of Engineers (USACE) regulates activities pursuant to Section 404 of the Clean Water Act (CWA); the California Department of Fish and Wildlife (CDFW) regulates activities under Sections 1602 of the Fish and Game Code; and the Regional Water Quality Control Board (RWQCB) regulates activities under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. The following discussion provides information about each agency's regulatory program.

In addition, Section IV, Appendix G (Environmental Checklist Form), of the California Environmental Quality Act Guidelines requires an evaluation of impacts to "federally protected wetlands as defined by Section 404 of the CWA (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means."

2.1 U.S. ARMY CORPS OF ENGINEERS

Pursuant to Section 404 of the CWA, the USACE regulates the discharge of dredged and/or fill material into waters of the United States (WUS).

On May 25, 2023, the U.S. Supreme Court released its decision in *Sackett v. Environmental Protection Agency*, (No. 21-454). The "Sackett decision" states, "the CWA's use of 'waters' refers only to geographic features that are described in ordinary parlance as 'streams, oceans, rivers, and lakes' and to adjacent wetlands that are 'indistinguishable' from those bodies of water due to a continuous surface connection" (Supreme Court of the United States 2023).

Guidance from the Environmental Protection Agency regarding the Sackett decision, provided August 28, 2023, included amendments to 40 Code of Federal Regulations (CFR) 120.2 and 33 CFR 328.3 including a definition of WUS as described below.

A. WUS means:
   1. Waters which are:
      i. Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
      ii. The territorial seas; or
      iii. Interstate waters;
   2. Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;
   3. Tributaries of waters identified in paragraphs (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;
   4. Wetlands adjacent to the following waters:
      i. Waters identified in paragraph (a)(1) of this section; or
      ii. Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;
   5. Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section.

The term "wetlands" is defined in 33 CFR 328.3(b) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

The discharge of dredge or fill material into WUS, including adjacent wetlands, requires authorization from the USACE under the CWA.

2.2 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Pursuant to Section 1602 of the Fish and Game Code, the CDFW regulates all diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife.

In 14 California Code of Regulations (CCR) 1.72, CDFW defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation."

In 14 CCR 1.56, CDFW's definition of "lake" includes "natural lakes or man-made reservoirs." Diversion, obstruction, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife requires authorization from CDFW by means of entering into a Lake or Streambed Alteration Agreement pursuant to Section 1602 of the Fish and Game Code.

2.3 CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

Pursuant to Section 401 of the CWA in California, before the USACE will issue a Section 404 permit, applicants must receive Section 401 Water Quality Certification from the RWQCB or State Water Resources Control Board. If a

Section 404 permit is not required for the project, the RWQCB may still require a permit (i.e., Waste Discharge Requirement) under the Porter-Cologne Water Quality Control Act. The RWQCB regulates the discharge of waste that could affect a "water of the state" (California Water Code, Section 13260[a]) pursuant to provisions of the Porter-Cologne Water Quality Control Act. Waters of the state are defined as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, Section 13050[e]).

3 METHODOLOGY

3.1 LITERATURE REVIEW AND DESKTOP ANALYSIS

WSP biologists conducted a literature review to identify potentially jurisdictional waters in the survey area including the following resources.

- Recent aerial imagery from 2022 (DigitalGlobe 2023) (Figure 4).
- Historical aerial photos (1994-2023) to identify changes in hydrology over time (Google Earth Pro 2023).
- USGS topographic maps to determine the presence of any drainages or other mapped water features (Figure 3).
- USFWS NWI maps to identify areas mapped as wetland features (USFWS 2023).
- Sweetwater Reservoir annual peak elevation data from 1990 through 2023 (SWA 2023).

The SWA biologist conducted a field review of vegetation with the JD study area on September 28, 2023. This field review along with long-term observation of the area informed hydrologic and hydrophytic vegetation results described below.

Federally regulated wetlands were identified based on the Wetlands Delineation Manual (USACE 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). Three criteria must be fulfilled in order to classify an area as a wetland under the jurisdiction of the USACE: 1) a predominance of hydrophytic vegetation (with greater than 5% cover), 2) the presence of hydric soils, and 3) the presence of wetland hydrology. Details of these criteria are described below:

- Hydrophytic Vegetation. The hydrophytic vegetation criterion is satisfied at a location if greater than 50% of all the dominant species present (using the 50/20 dominance rule) within each vegetation unit have a wetland indicator status of obligate (OBL), facultative wetland (FACW), or facultative (FAC) (USACE 2008). An OBL indicator status refers to plants that almost always found in wetlands, rarely in uplands. A FACW indicator status refers to plants that are usually found in wetlands but are occasionally found in uplands. A FAC indicator status refers to plants that occur in both wetlands and uplands. Other wetland indicator statuses include facultative upland (FACU) which includes plants that usually occur in uplands but are occasionally found in wetlands, upland (UPL) which refers to plants that are almost always found in uplands, and plants that are not listed (NL) for plants that do not occur on the National Wetlands Plant List. The wetland indicator status used for this report follows the 2022 National Wetland Plant List (USACE 2023).
- Hydric Soils. Hydric soils are soils that form under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the surface soil environment, normally up to 18-inches below ground surface (USACE 2008). Saturation or inundation, when combined with microbial activity in the soil, causes the depletion of oxygen which promotes the accumulation of organic matter and the reduction, translocation, or accumulation of iron and other reducible elements (USACE 2008). These processes result in distinctive characteristics that persist in the soil during both wet and dry periods including dark or Gleyed matrix, redox concentrations and depletions.

- Wetland Hydrology. The wetland hydrology criterion is satisfied at a location based upon conclusions inferred from field observations or historical data that indicate an area has a probability of being inundated or saturated (flooded, ponded, or tidally influenced) long enough during the growing season to develop anaerobic conditions in the surface soil environment, especially the root zone (USACE 1987 and 2008).

4 RESULTS

4.1 HYDROLOGY

The Sweetwater Reservoir (below the 239' elevation) receives water from rainfall/runoff into the Reservoir, water transfers from Loveland Reservoir, and/or imported water delivered via the San Diego County Water Authority aqueduct. The water sources are highly variable and water extraction for drinking water treatment results in a fluctuating water level that rises, typically during the late fall to early spring months, then drops through the spring and into fall until the cycle returns. The highest reservoir levels, up to the 239' maximum, result mostly from annual rainfall (P. Famolaro, pers. comm.) Sweetwater Reservoir peak elevation data (1990-2023) is presented in Table 1 below as provided by (SWA 2023).

Table 1.
Sweetwater Reservoir Annual Peak Elevations (1990-2023)

Year	Date of Annual Peak Elevation	Elevation (feet AMSL)
1990	May 1	220.0
1991	April 5	230.3
1992	March 30	223.3
1993	January 19	**239.5**
1994	January 1	231.4
1995	April 21	**239.3**
1996	January 14	231.3
1997	April 27	226.0
1998	May 19	**239.1**
1999	January 29	235.0
2000	March 6	226.1
2001	April 24	225.2
2002	May 1	213.2
2003	May 4	224.6
2004	May 29	223.5
2005	March 11	233.9
2006	March 5	231.7
2007	July 11	221.9
2008	March 24	223.8
2009	April 22	220.9
2010	April 14	229.0

Year	Date of Annual Peak Elevation	Elevation (feet AMSL)
2011	June 4	230.1
2012	February 16	231.8
2013	February 11	220.8
2014	April 11	198.6
2015	March 5	197.7
2016	February 1	197.0
2017	March 23	224.6
2018	January 1	213.1
2019	March 24	224.7
2020	April 22	214.1
2021	February 13	221.0
2022	December 31	209.4
2023	June 16	229.19

*- data provided by SWA 2023
AMSL- above mean sea level

The exposed shoreline (or area from the water edge up to the 239' maximum level) varies with the fluctuating water level. Hydrologic input to these shoreline areas, including that for the JD study area, is from soil capillary movement from the reservoir water source as well as annual rainfall. Soil capillary movement, however, is limited in the JD study area due to steep topographical gradient (approximately 1:1). These exposed reservoir areas in the JD study area function more as uplands rather than wetlands (P. Famolaro, pers. comm.).

4.2 HYDRIC SOILS

Soils within the open water portion of the reservoir would have hydric soil characteristics given their long-term inundation. The San Miguel rocky silt loam, 9 to 30 percent slopes along upland slopes of the Reservoir are not listed as hydric soils in San Diego County (USDA 2023b). Varying water levels and steep slopes of the mapped San Miguel soil series along the outer margins of the reservoir likely precludes the development of wetlands in the JD study area where these soils occur.

4.3 HYDROPHYTIC VEGETATION

Although hydrophytic vegetation can sometimes occur on the margin of the reservoir, this condition is highly dependent on the reservoir grade and duration water is held at a certain level (P. Famolaro, pers. comm.). The reservoir gradient where wetland could develop in the project area is relatively steep and rocky terrain, therefore, hydrophytic vegetation has little time to establish given the varying water levels due to incoming runoff or drawdown from pumping. Only salt cedar (*Tamarix* sp.) (hydrophytic classification of FAC) occurred within the wetted portion of the Reservoir, and these individuals were established when the Reservoir was at a lower level. Marsh cudweed and nutsedge have hydrophytic classification of FACW and OBL, respectively, however, these occurrences were limited to a few individuals and not demonstrative of a wetland vegetation community (P. Famolaro, pers. comm.).

5 PROJECT IMPACT ASSESSMENT

Table 2 shows fill volumes that were calculated based on the proposed project materials. These are amounts that will be installed below the 239' elevation. Aeration piping fill within the Sweetwater Reservoir is based on approximately 2,590 linear feet of air supply and buoyancy pipe (1, 3, and 4-inch piping) and 215 linear feet of shoreline sleeve pipe (10-inch pipe). Approximately 134 concrete anchors, each covering an area of approximately 1.41 square feet and 0.6 feet high (0.031 cubic yards each), will be placed at the bottom of the lake to keep the pipe anchored to the bottom and tethered to the same location with approximately 1-inch diameter coated stainless steel cables (1,340 total length of cable). Total permanent fill into jurisdictional waters is calculated as 22.81 cubic yards.

Table 2.
Summary of Fill Required for the Reservoir Aeriation and Destratification Project

Type of Material	Volume
Aeration diffuser tubing (4,000 feet of 1-inch piping)	0.81 CY
Aeration air supply piping (2,375 feet of 3-inch piping)	4.32 CY
Aeration buoyancy piping (2,375 feet of 4-inch piping)	7.68 CY
Sleeve piping (215 feet of 10-inch piping)	4.34 CY
Sleeve supports (40 at 0.031 CY each)	1.24 CY
Anchors (134 at 0.031 CY of concrete each)	4.15 CY
Anchor cables (1,340 feet of 1-inch cable)	0.27 CY
Total Jurisdictional Fill	**22.81 CY**

CY- Cubic yards

6 CONCLUSIONS/REGULATED WATERS

The water level of the Sweetwater Reservoir reaches 239' with the elevation of the dam spillway at the western edge of the Reservoir. The last time water spilled over the Sweetwater Dam (239') was in 1998 (SWA 2023). However, recent coordination (e.g. Nationwide Permits SPL-2018-00307-JDR and SPL-2020-00456-MER) between SWA and USACE has identified that 239' reservoir elevation as the area regulated under the CWA. The USACE, in combination with the U.S. Environmental Protection Agency, reserves the ultimate authority in making the final determination of presence and extent of WUS including wetlands.

Based on the evaluation of hydrology, hydric soils, and hydrophytic vegetation, no wetlands are present within the project and JD study area. However, open water habitat is present and will be impacted by the installation of the project. It is likely that permits will be required under Section 404 of the CWA from the USACE, Section 401 Water Quality Certification from the RWQCB, and Section 1602 of the State Fish and Game Code from the CDFW.

The RWQCB may determine the project to be an "Ecological Restoration and Enhancement Project" given that the project is "voluntarily undertaken for the purpose of assisting in controlling the recovery of an aquatic ecosystem that has been degraded, damaged, or destroyed to restore some measure of its natural condition and to enhance the beneficial uses, including potential beneficial uses of water."

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APPENDIX A: SITE PHOTOGRAPHS

Photo Log
Sweetwater Reservoir Aeration and Destratification Project (06/18/2023 and 06/19/2023)

PHOTO 1. Project Area

PHOTO 2. Location for future compressor area.

Photo 3. Aeration pipe will be located to the left of the logged boundary.

Photo 4. Location where aeration pipeline will extend into water from land.

Photo 5. Location where aeration pipeline will extend into water from land to the right of the logged off area. Aeration Structures to be located where current boat trailer stands.

Photo 6. Location where aeration pipeline will extend into water from land to the right of the logged off area. Aeration Structures to be located where current boat trailer stands.

AQUATIC RESOURCE DELINEATION REPORT

SWEETWATER RESERVOIR
AERATION AND DESTRATIFICATION PROJECT
SAN DIEGO, CA
WSP PROJECT NO. 2355502002

Prepared for:

SWEETWATER AUTHORITY

Israel Marquez

JULY 2024

Aeration Pipe and Related Features
Compressor Facility
Retaining Wall
Study Area
239-foot High Water Mark / U.S. Water Boundary

1 inch = 500 feet
0 250 500 Feet

FIGURE 4

Project Vicinity and Features
Aeration and Destratification Project
Sweetwater Authority
San Diego, CA

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