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November 29, 2006

Mr. Bill Pfanner
Project Manager
Systems Assessment and Facility Siting Division
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814-5512

Subject: LSP South Bay, LLC - South Bay Replacement Project AFC (06-AFC-3): Data Response, Set 1A

Dear Mr. Pfanner:

On behalf of LSP South Bay, LLC, please find attached 12 copies and one original of the Data Responses, Set 1A, in response to Staff's Data Requests dated October 31, 2006. For docketing purpose, also find attached the Proof of Service declaration. We have also file copies of this Data Response electronically.

We will coordinate this submittal with the Commission's Docket Unit.

LSP South Bay, LLC appreciates the continued opportunity to work with CEC staff on this important project. Please call me if you have any questions.

Sincerely,

CH2M HILL

Robert C. Mason
Senior Project Director

c: Docket Unit - California Energy Commission
Kevin Johnson, LSP South Bay, LLC
Proof of Service List

Data Response, Set 1A

South Bay Replacement Project (06-AFC-3)

Prepared for

LSP South Bay, LLC

November 2006

CH2MHILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA95833

INTRODUCTION

Technical Area: Air Quality
CEC Authors: Tuan Ngo

BACKGROUND

The AFC states that the facility will use natural gas with an assumed maximum short-term sulfur content of 0.75 grains per hundred standard cubic feet (gr/100scf), but on an annual average, the sulfur content of natural gas would not exceed 0.25 gr/100scf

DATA REQUESTS

1. Please provide documentation from the proposed natural gas supplier of the guaranteed peak and average fuel sulfur content levels.

   Response: Enclosed as Attachment AIR-1 is a copy of the San Diego Gas and Electric Company (SDG&E) Rule 30 tariff that shows a maximum allowable natural gas total sulfur content of 0.75 grains/100 scf. This value is shown on Sheet 9, in Section H.2.e. SDG&E does not guarantee the average fuel sulfur content of the fuel.

2. Please provide the most recent six months of daily peak and average gas sulfur content values from the proposed natural gas supplier, collected at the nearest available location to the proposed facility gas tie-in. If daily peak and average values are not available, please provide either weekly or monthly sulfur content values, whichever is available, with an explanation as to why short term measurements are not available

   Response: Enclosed as Attachment AIR-2 is a summary of the daily natural gas total organic sulfur (TOS) content sampling results for the Rainbow Natural Gas Compressor Station which is the main natural gas supply point for the SDGE system. As shown in this summary, during the period from January to September 2006, the peak and average daily natural gas TOS contents are 0.29 and 0.07 grains/100 scf, respectively.

3. Please provide the steps and method the applicant will use to ensure continuous compliance with the sulfur content limits specified for the supplied natural gas fuel.

   Response: The Applicant will monitor the sulfur content of the natural gas based on monthly samples of natural gas composition or gas supplier documentation. The sampling frequency may be reduced depending on the compliance margin observed. The Applicant will negotiate appropriate conditions to implement this requirement with the Commission staff.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

BACKGROUND: START UP AND SHUT DOWN EMISSIONS

Table 8.1-21 lists the maximum start up emissions of each turbine as 320 pounds per hour (lbs/hr) for oxides of nitrogen (NOx), 2,000 lbs/hr for carbon monoxide (CO), and 32 lbs/hr for volatile organic compounds (VOC). The footnote of this table states that the facility maximum hourly emissions will not exceed the above limits regardless of whether one of both turbines are simultaneously in start up mode.

DATA REQUEST

4. Please explain the steps that the applicant will take to ensure continuous compliance with the facility's hourly, daily and annual emission limits during start ups and shut downs.

   Response: The gas turbines will be equipped with NOx and CO continuous emissions monitoring (CEM) systems that will be able to monitor hourly, daily, and annual emissions, including during gas turbine startups and shutdowns. For VOC emissions, short- and long-term emissions will be monitored based on fuel use levels and emission factors. The VOC emission factors will be confirmed during annual compliance tests.

BACKGROUND: DUCT BURNER USAGE

The AFC section 8.1.5.1.1 states that duct firing "will be used infrequently (typically less than a 10 percent capacity factor on an annual basis)…" Appendix Table 8.1B-4 uses two different assumed duct firing assumptions: 800 hours per year to calculate the NOx emissions and 500 hours per year to calculate all other air contaminants.

DATA REQUEST

5. Please provide the maximum hours per year the facility would operate with duct burner and provide any associated assumptions and calculated emissions levels.

   Response: As shown in Table 8.1B-4 of the AFC for the maximum NOx operating scenario, the maximum hours per year of duct burner operation is expected to be approximately 800 hours/year. For the annual operating scenarios for the other pollutants, a lesser number of duct burner operating hours were assumed due to a corresponding greater number of non-duct burner baseload operating hours and/or startup/shutdown hours. However, the Applicant proposes that duct firing be limited through annual fuel consumption and emission caps for the facility, and not based on hours of operation.

BACKGROUND: ESTIMATED FACILITY EMISSIONS

The AFC section 8.1.5.2 provides tables, assumptions, and explanations of calculations used to estimate the facility air contaminants emissions. This section references Appendix 8.1B for specific assumptions used in each calculation steps. Appendix 8.1B contains numerous tables showing the results of the calculations for the facility's emissions without supporting explanations and discussions of the necessary

assumptions. As a result, staff cannot reproduce the facility's emissions that are listed throughout AFC Section 8.1.5.2 and Appendix 8.1B.

DATA REQUEST

6. Please provide the maximum number of start up and shut down events on a daily and annual basis.

   Response: As shown in Table 8.1B-4 of the AFC, maximum daily emissions are based on 6 hours/day of gas turbine startups/shutdowns. Maximum annual emissions are based on 520 hours/year of gas turbine startups/shutdowns. However, the Applicant proposes that emissions from startups and shutdowns be limited through appropriate facility emission caps, and not based on operating limitations.

7. Please provide actual calculations, assumptions, and methods used to estimate the facility daily and annual emissions provided in Tables 8.1-23 and 8.1-26.

   Response: The detailed emission calculations for Table 8.1-23 are shown in Tables 8.1B-4 and 8.1B-5 of the AFC. The detailed emission calculations for Table 8.1-26 are shown in Tables 8.1B-8 and 8.1B-9 of the AFC. If there are more specific questions related to these tables, the Applicant would be pleased to answer them.

8. Please provide the maximum annual operation hours for the auxiliary boiler.

   Response: As shown in Table 8.1B-4 of the AFC, the maximum expected annual operating hours for the auxiliary boiler are 1,664 hours/year. As shown in the annual operating scenarios in Table 8.1B-4 of the AFC, the number of boiler operating hours decreases as the number of gas turbine baseload operating hours increases because there is no need to operate the boiler if a gas turbine is operating. The Applicant proposes that emissions from the auxiliary boiler be limited based on annual fuel consumption and emission limits, and not based on limits on the hours of operation.

9. Please provide turbine vendor guarantees to support the proposed emissions values listed in Appendix 8-1B.

   Response: The emission estimates in the AFC are based on expected BACT levels. Since the project is still in the permitting phase, no equipment has been purchased for the project. Consequently, equipment guarantees are not available at this time.

10. Please provide explanations for footnote c of Table 8.1-23, which states that "…maximum annual VOC emissions occur under an operating scenario that does not include startups…" This statement does not support the maximum and average hourly start ups and shut down emissions that are provided in Table 8.1-21.

    Response: While it is true that hourly VOC emissions during a gas turbine startup/shutdown are expected to be higher then during baseload operation, for a gas turbine startup/shutdown to occur there must be a period of time when the gas turbine is not operating. Therefore, there is a trade-off between gas turbine startup/shutdown hours and hours when the gas turbine is not operating. Because of the gas turbine non-operating hours associated with each gas turbine startup, maximum annual VOC

emissions will occur with full time operation of the gas turbines rather than during cyclic operation of the gas turbines when there will be a combination of startup/shutdown, baseload, and non-operating hours.

11. Please provide estimates of ammonium nitrates and ammonium sulfates, including any assumptions used, due to estimates of 226.9 tons of annual ammonia emissions.

Response: The emission estimates for the project were based on the following:

a. NOx emissions assume that 100% of emissions are in the form of NO_2;
b. SOx emissions assume that 100% of emissions are in the form of SO_2; and
c. Ammonia emissions assume that 100% of emissions are in the form of NH_3.

Consequently, no sulfate or nitrate emissions were calculated in the AFC for this project. According to a report prepared for the CEC[1] the average sulfate and nitrate emission rates for natural gas-fired F-Class gas turbines are approximately 0.034 and 0.042 lbs/hr, respectively. These emission rates are for an average heat input of approximately 1,810 MMBtu/hr[2]. The corresponding average sulfate and nitrate emission factor would be approximately 1.88E-5 lbs/MMBtu and 2.32E-5lbs/MMBtu, respectively. With a maximum heat input of 2,453 MMBtu/hr for each SBRP gas turbine/HRSG, the sulfate emission rate would be approximately 0.046 lbs/hr and the nitrate emissions would be approximately 0.057 lbs/hr per gas turbine/HRSG.

BACKGROUND: CALCULATION OF EXISTING SBPP BASELINE EMISSIONS

Similar to the above background statement on the facility's estimated emissions above, the AFC section 8.1.5.2.2 consists of one paragraph that describes how the existing South Bay Power Plant (SPBB) baseline emissions were calculated using the fuel use records for the immediate preceding two years prior to the preparation of the SBRP AFC. The rest of the calculations referred to Appendix 8.1B, however, calculations, explanations and assumptions used are not included in Appendix 8.1B.

DATA REQUEST

12. Please provide detailed step by step calculations and specific assumptions used to calculate the SBPP facility baseline emissions of each criteria and non-criteria air contaminants.

Response: The detailed baseline emission calculations for the SBPP are shown in Table 8.1B-7 of the AFC. This table shows the two-year baseline fuel use level for each unit along with the emission factors used to calculate the two-year emission levels. For NOx, this table also shows a summary of the CEM emissions data for each unit. See Data

[1] Development of Fine Particulate Emission Factors and Speciation Profiles for Oil- and Gas-Fired Combustion Systems, February 2005, CEC-500-2005-039. Table 4-8.
[2] Development of Fine Particulate Emission Factors and Speciation Profiles for Oil- and Gas-Fired Combustion Systems, February 2005, CEC-500-2005-039. Table 4-2 (average of test runs 1-3).

Response 13 for additional information regarding the emission factors used for the SBPP baseline emission calculations.

13. Please explain why emission factors were taken from the Environmental Protection Agency's (EPA) AP-42 publication, instead of providing actual source test results used to calculate the SBPP baseline emissions.

Response: The baseline emission calculations for the SBPP are based on AP-42 emission factors for CO, VOC, and PM_{10} because that was the basis for the emission calculations in previous annual emission inventory reports submitted to the SDAPCD for the SBPP. See Data Response 16 regarding availability of source test reports.

14. Please provide specific amounts of each type of liquid fuel (bunker No.6 and jet fuel), on a quarterly basis, that were used at the existing facility in 2004 and 2005.

Response: Enclosed as Attachment AIR-14 is a table summarizing the liquid fuel use at the SBPP during 2004 and 2005 on a quarterly basis. This table was included as part of an August 21, 2006 letter to the SDAPCD that has been provided to the CEC on August 23, 2006. The liquid fuel use for the boilers is No. 6 oil. The liquid fuel use for the gas turbine is jet fuel.

15. Please provide copies of existing permits for existing SBPP units 1 to 4 and the SBPP combustion turbine.

Response: Enclosed as Attachment AIR-15 are copies of the current SDAPCD permits for the SBPP.

16. Please provide summaries of the most current source test results for the above boiler and combustion turbine units.

Response: Enclosed as Attachment AIR-16 are copies of the most recent NOx source test results for the SBPP boilers and gas turbine. As shown in Attachment AIR-16, the most recent NOx compliance tests for Units 1 through 4 (boilers) and the gas turbine occurred earlier this year. The most recent CO, HC, and PM_{10} source tests for Unit 1 occurred in 1997. The PM_{10} source test was only for oil-firing. The most recent PM_{10} tests for Units 2, 3, and 4 occurred in 2001, but once again only for oil-firing. The Applicant has been unable to find any other CO, VOC, or PM_{10} source test reports for the units at the SBPP.

17. Please provide explanations of why Reasonably Achievable Control Technology (RACT) emission limits were not used to adjust the SBPP facility baseline emissions.

Response: To comply with the SDAPCD boiler RACT rule (Rule 69), the four boiler units at the SBPP were equipped with SCR systems. The installation of the SCR systems was completed in 2001. In addition, the SBPP gas turbine complies with the SDAPCD gas turbine RACT rule (Rule 69.3) and is equipped with steam injection. Consequently, the 2004-2005 baseline emissions for the SBPP meet RACT requirements and a further RACT adjustment was not necessary.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

BACKGROUND: POTENTIAL PSD APPLICABILITY

The AFC states that the new project would replace the existing SPBB, and that the net emission increases would not exceed the federal Prevention of Significant Deterioration (PSD) threshold; therefore, the project is not a major modification.

The AFC Section 1.9 states that the services of the existing "…SBPP will continue indefinitely until there are changes to the regional power plant and transmission system and CAISO removes the RMR status for SBPP."

Therefore, it appears that the modification to this stationary source would result in a net emission increase of each criteria air contaminant equal to the new emissions of the proposed SBRP, identified in Table 8.1-34, at least until the shut down and demolition of the existing SBPP is completed. Therefore the project can be viewed as a major modification to a major stationary source and thus may require a complete PSD review analysis.

> **General Data Response 18:** While there may be some operation of the SBPP during the commissioning phase of the SBRP, after the SBRP begins commercial operation the SBPP will be taken out of service and demolished. Regarding the potential for simultaneous operation of the SBPP and SBRP during the commissioning period, the combined emissions for these two plants will be monitored during the commissioning period. The combined SBPP/SBRP emissions during the commissioning period and the SBRP emissions following the commissioning period will not exceed the maximum annual emissions projected for the SBRP in the AFC (see Table 8.1-23).

DATA REQUEST

18. Please provide detailed analysis to demonstrate that the facility, which includes the proposed project and the existing SBPP, is exempt from PSD review during any overlapping commissioning, operation, and demolition scenarios for the existing and replacement units.

    Response: As discussed in General Data Response 18, the combined SBPP/SBRP emissions during the commissioning period and the SBRP emissions following the commissioning period will not exceed the maximum annual emissions projected for the SBRP in the AFC (see Table 8.1-23). Consequently, the net emission changes shown in Table 8.1-25 of the AFC remain unchanged and the SBRP will not trigger PSD review. With regards to construction/demolition emissions, and consistent with District and EPA regulations, since these are temporary emission sources they are not included in the calculation for purposes of PSD applicability. These emissions have been quantified, however, for purposes of CEQA review.

19. If you cannot demonstrate that the proposed project and the SBPP exempt from PSD review, please provide additional discussion and analysis demonstrating compliance with the PSD requirements, including, but not limited to: (a.) identification of Class I and Class II areas; (b.) identification of potential impacts and mitigation in such areas; (c.) revised modeling analysis to include

both proposed and existing project in operation; and (d.) a revised incremental analysis.

Response: As discussed in Data Response 18, the proposed project will not trigger PSD review.

BACKGROUND: AMMONIA EMISSIONS

The AFC Section 8.1.5.2.4 identifies that the project would maintain ammonia emissions of 10 ppm at the selective catalytic reduction (SCR) system exhaust.

DATA REQUEST

20. Please provide an explanation of why SCR systems with ammonia slip at 5 ppm or less are not technically feasible and cost-effective, or provide other documentation to support the proposed SCR with 10 ppm ammonia slip.

    Response: Technically feasible/cost effectiveness are terms associated with a BACT analysis. Because ammonia is not a pollutant regulated under the SDAPCD's New Source Review (NSR) regulations, there is no BACT requirement for ammonia emissions. Consequently, there is no NSR requirement to perform a technical feasibility/cost effectiveness analysis for ammonia. The 10 ppm ammonia slip level used in the AFC for this project was selected because this level has been approved by the CEC for several power plant projects in California over the past years. For example, two projects approved by the CEC during the last two years with 10 ppm ammonia slip limits are the San Joaquin Valley Energy Center (approved 01/21/04, 01-AFC-22) and the Blythe Energy Project Phase II (approved 12/14/05, 02-AFC-01).

BACKGROUND: AIR QUALITY IMPACT ANALYSIS

The AFC Section 1.9 states that the services of the existing "…SBPP will continue indefinitely until there are changes to the regional power plant and transmission system and CAISO removes the RMR status for SBPP." Thus, for a number of weeks, months or years, it is likely that both the proposed project and the SBPP will simultaneously be operating. Therefore, regardless of whether the proposed project and the SBPP could be exempt from the PSD review, it is necessary to determine the combined air quality impacts of both projects in operation through air dispersion modeling analyses.

DATA REQUEST

21. Please describe the modeling inputs (stack height, stack diameter, volumetric flow rate, and emission rates of NOx, CO, PM10 and SO2 for the existing boilers and combustion turbine) that would be used in an air dispersion modeling analysis of the existing SBPP.

    Response: See General Data Response 18 and Data Response 22.

22. Using the input parameters from the data request above, provide an air dispersion modeling analysis (using the same modeling approach provided in the

AFC), of the simultaneous operation of both the SBPP under "normal" operation and the SBRP under the worst case initial commissioning scenario. Provide all input and output files in CD form.

Response: See General Data Response 18. The requested modeling will be accomplished before the end of December 2006 as noted in the Applicant's November 9, 2006 letter to the CEC requesting additional time to respond to selected data requests.

23. Please execute the modeling analysis in data request 22 for the SBRP operating under the worst case normal operations with all input and output files in CD form.

Response: See General Data Response 18 and Data Response 22.

24. Provide summary tables of the results of the modeling analysis performed for the data requests above in a format similar to AFC Table 8.1-30.

Response: See General Data Response 18 and Data Response 22.

BACKGROUND: IMPACTS DURING FACILITY OPERATING AND DEMOLITION OF SBPP

The AFC sections 1.9 and 8.1.5.5 appear to be in conflict regarding whether and when the existing SBPP would be shut down and be demolished until the SBRP is fully operational (p. 8.1-51). Section 8.1.5.5 also states that a detailed analysis of the emissions and ambient impacts is included in Appendix 8.1F. Staff found that Appendix 8.1F has analysis of emissions and impacts for construction activities for the proposed project, but has not been able to find substantive material on the emissions and impact due to demolition of the existing SBPP.

DATA REQUEST

25. Please describe the modeling inputs for NOx, CO, and PM10 that would be used in an air dispersion modeling analysis of the demolition of the existing SBPP.

Response: See General Data Response 18 and Data Response AIR-26.

26. Please provide an air dispersion modeling analysis (using the same modeling approach provided in the AFC), of the simultaneous commissioning or operation of both the proposed project and the demolition of the existing SBPP. Provide all input and output files in CD form.

Response: See General Data Response 18. The requested modeling will be accomplished before the end of December 2006 as noted in the Applicant's November 9, 2006 letter to the CEC requesting additional time to respond to selected data requests.

27. Provide summary tables of the results of the modeling analysis performed in the data request above in a format similar to AFC Table 8.1-30.

Response: See General Data Response 18 and Data Response 26.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

BACKGROUND: TURBINE COMMISSIONING

Section 8.1.5.3.3 identifies several scenarios where the proposed turbines undergo various operations with and without emission control systems in operation. Under the full speed, no load test (phase 1) the turbines' worst case NOx emissions can be as high as 100 ppm; under the minimum load test (without control, phase 2), the turbines' NOx emissions would be in the range of 9 ppm; and under full speed, no load (without control, phase 3) the NOx emissions would be 5.5 ppm.

DATA REQUEST

28. Please provide an explanation of why the turbines' NOx emissions vary from 5.5 ppm to 100 ppm during commissioning even though no control systems are in operation.

    Response: As shown in Table 8.1B-9 of the AFC (footnote 2), the 100 ppm NOx level is for the commissioning test with elevated emissions from the dry-low NOx combustor because the combustor is not fully tuned and no SCR is installed. The 9 ppm NOx level is for the commissioning tests with the dry-low NOx combustor tuned and meeting its expected emission level, but with no SCR installed. The 5.5 ppm NOx level is for the commissioning tests with the dry-low NOx combustor tuned and with the SCR installed and achieving a partial control level (midpoint between an uncontrolled level of 9 ppm and a fully controlled level of 2 ppm).

29. The turbines that are proposed in the AFC are the GE Frame 7F. Please explain why the applicant chose to use the experiences of commissioning the GE Frame 7EA turbines at the Turlock Irrigation District's Walnut Energy Center (02-AFC-4C) instead of the many Frame 7F projects that have seen commissioning in California in recent years (Sunrise, Elk Hills, Los Medanos, Delta, Moss Landing, Pastoria and Palomar).

    Response: Because complying with commissioning emission levels has been difficult at some 7FA projects (e.g., Palomar), leading to the need for a variance in at least one case, the Applicant chose to present a commissioning plan and schedule that was sufficiently phased and long enough to assure success without needing a variance. Not having the detailed commissioning plan for all recent power plant projects, the Applicant believed the Walnut Energy Center plan to commission its 7EA turbines included the detail the Applicant want and a conservatively large number of testing hours. The Applicant does not believe that the differences between the 7EA turbines and the larger 7FA turbines proposed for SBRP are sufficient to indicate different lengths of time for commissioning activities.

BACKGROUND: TEMPORARY OFFSETS

Section 8.1.6.3.2 of the AFC describes the proposed project as a modification to an existing stationary source, i.e., the new SBRP will replace the existing SBPP facility and units, therefore, contemporaneous emission reductions from the shut down of existing SBPP facility would be used to offset the new emissions from the SBRP. In other words,

the stationary source's post project emissions would be as much as, or exceed, the existing facility's pre-project emissions. However, as indicated in Section 1.9, the shut down of the existing SBPP facility is not entirely based on the decision of the applicant. Without enforceable permit condition(s), for both the proposed project and the existing SBPP, emission reductions from the shut down of the existing SBPP may not be contemporaneous, real, actual, permanent and enforceable. Therefore, it appears that the real impacts to the environment may have been severely underestimated, at least for a period when both plants are operating.

DATA REQUEST

30. During the period when the SBPP is still operated along side of the new SBRP, please provide additional temporary emission reductions to mitigate the project's emission impacts.

    Response: See General Data Response 18. As shown in Tables 8.1-34 and 8.1-35 of the AFC, there will be a net emission reduction in NOx, VOC, and PM_{10} emissions associated with the proposed project. In addition, there will also be a net emission reduction of PM_{10} and ozone precursors. As discussed in General Data Response 18, while there may be some operation of the SBPP during the commissioning phase of the SBRP, after the SBRP begins commercial operation the SBPP will be taken out of service and demolished. The combined emissions for these two plants will be monitored during the commissioning period. The combined SBPP/SBRP emissions during the commissioning period and the SBRP emissions following the commissioning period will not exceed the maximum annual emissions projected for the SBRP in the AFC (see Table 8.1-23), and, hence no new emission reduction or mitigation requirements will be triggered. With regards to short-term ambient impacts during the combined SBPP/SBRP operation during the commissioning period, see Data Response 22.

31. Please provide detailed calculations, and any and all assumptions used to estimate the temporary emission reductions identified above.

    Response: As discussed in Data Response 30, no additional emission reductions or mitigation are necessary to address commissioning activities.

BACKGROUND: REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT) ADJUSTMENT OF OFFSETS

Other issues involve evaluating the emission reductions from the shut down of the existing SBPP including the detailed calculations using actual test results, and the adjustment of the reductions for RACT. These factors could reduce the amount of available emission reductions. Again the foreseeable impacts from the operations of the SBRP may have been severely underestimated and under mitigated.

DATA REQUEST

32. Please identify steps that the applicant will take to secure sufficient and fully adjusted emission reductions of NOx, VOC, SOx, PM10 and PM2.5, including ammonia derived secondary PM2.5, to mitigate the proposed project impacts.

Response: As discussed in Data Responses 13 and 17, the emission reductions associated with the shutdown of the SBPP were calculated correctly. In addition, as discussed in Data Response 30, the emission reductions for the shutdown of the SBPP are sufficient to mitigate the emissions for the SBRP, including potential overlapping operations during commissioning of the new units. Consequently, the Applicant does not believe that additional air quality mitigation measures are required.

BACKGROUND: CUMULATIVE IMPACTS ANALYSIS

Section 8.1.7 states that an approved protocol for conducting a cumulative impacts analysis is included in Appendix 8.1H of the AFC.

DATA REQUEST

33. Please provide the cumulative impacts analysis or identify the timeline for completion and submittal of the cumulative impacts analysis.

Response: Information on candidate facilities to be potentially included in a cumulative air quality impact analysis was requested from the SDAPCD in two letters submitted on December 21, 2005 and April 24, 2006. The requested information has not yet been received, but upon timely receipt of such in the near future, the cumulative impact modeling will be accomplished before the end of December 2006.

Background: SOX Mitigation

Section 8.1.8 states that the project will result in net reductions of NOx, VOC and PM10 emissions and an increase in SOx emissions. Table 8.1-25 shows that the proposed project would result in a net SOx emission increase of 4.1 tons per year (TPY) after the shut down of SBPP. Because the SOx emissions increase would be below the District threshold for providing offsets, no SOx mitigation is required. However, since SOx is a precursor to PM10 and PM2.5 and the area is non-attainment for both the state's PM10 and PM2.5 standards, the increase of SOx emissions should be mitigated.

DATA REQUEST

34. Please discuss the steps that applicant will take in providing 4.1 TPY additional SOx emission reductions to mitigate the project's SOx emission contribution to the ambient air quality.

Response: As shown in Table 8.1-30 of the AFC, the modeled SO_2 impacts for the proposed project, along with ambient background levels, are well below State and Federal standards. In addition, as shown in Table 8.1-35, there will be a net emission reduction of PM_{10} precursors of approximately 9 tons/year associated with the proposed project. Therefore, the Applicant believes that additional mitigation for the proposed project is not required.

35. Please provide a schedule for obtaining the additional 4.1 TPY of SOx emission reductions.

Response: See Data Response 34.

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

The general terms and conditions that apply whenever the utility transports customer-procured gas over its system are described below. This rule shall be a part of any contract to provide such service.

A. GENERAL

1. Subject to the terms, limitations and conditions of this rule and any applicable CPUC-authorized rate schedule, directive, or rule, the customer will deliver or cause to be delivered to the utility, and accept on redelivery, quantities of customer-owned gas which shall not exceed the daily transportation capacity as set forth in the Contract. The utility will accept such quantities of gas from the customer, or its designee, and redeliver to the customer on a reasonably concurrent basis, an equivalent quantity, on a therm basis, to the quantity accepted.

2. The customer warrants to the utility that the customer has the right to deliver the gas provided for in the Contract and that the gas is free from all liens and adverse claims of every kind. The customer will indemnify, defend and hold the utility harmless against any costs and expenses on account of royalties, payments or other charges applicable before or upon delivery to utility of the gas under the Contract.

3. The point(s) where the utility will receive the gas into its system (point(s) of receipt) and the point(s) where the utility will deliver the gas from its system to the customer (point(s) of delivery) will be set forth in the Contract. Other points of receipt and delivery may be added by written amendment of the Contract by mutual agreement. The appropriate delivery pressure at the points of delivery to the customer shall be that existing at such points within the utility's system or as specified in the Contract.

4. Shippers other than customers may receive noncore intrastate transmission service on behalf of specified customers. A shipper which demonstrates that it has a contract to supply gas to a customer may, with the customer's approval, exercise the customer's rights to transmission service on behalf of the customer. Such a shipper may aggregate the rights of several customers for purposes of contract administration, applicable use-or-pay requirements or balancing requirements. The customer shall remain ultimately responsible to the utility for payment of all applicable charges.

5. A customer may aggregate multiple facilities for purposes of contract administration, applicable use-or-pay requirements or balancing requirements.

B. QUANTITIES

1. Utility shall as nearly as practicable each day redeliver to customer, and customer shall accept, a like quantity of gas as is delivered by customer to utility on such day. It is the intention of both parties that the daily deliveries of gas by customer for transportation hereunder shall approximately equal the quantity of gas which customer shall receive at the points of delivery listed in the Contract. However, it is recognized that due to operating conditions either in the fields of production, in the delivery facilities of third parties, or in the utility system, deliveries into and redeliveries from the utility system may not balance on a day to day basis. The utility and customer will use all due diligence to assure proper load balancing in a timely manner.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

B. Quantities (Continued)

2. Imbalances and associated charges will be calculated in accordance with the conditions specified in Schedule G-IMB.

3. The gas to be transported hereunder shall be delivered and redelivered as nearly as practicable at levels equal to customer's hourly and daily usage. Utility may refuse to accept fluctuations in excess of customer's maximum daily quantity (MDQ), from day to day, if in utility's opinion receipt of such gas would jeopardize other operations. Customer may make arrangements acceptable to utility to waive this requirement. Utility does not undertake to redeliver to customer hereunder any of the identical gas accepted by utility for transportation, and all redelivery of gas to customer will be accomplished by substitution on a therm for therm basis.

4. Gas shall be transported herein for use only by customer within California, and not for delivery or resale to a third party unless authorized by the CPUC.

5. If customer does not use the full contract quantity specified in the Contract, the utility shall have the right to reasonably reduce annual and daily quantities to the customer's historical demand level evidenced at the time the contract is signed and/or by the customer's actual use of transportation service, as determined by the utility on an ongoing, reviewable basis.

C. Operational Requirements

1. The customer must provide to the Utility the name(s) of its shipper(s) as well as any brokers or agents ("agent") used by the customer for delivery of gas to the Utility for transportation service hereunder and their authority to represent customer. Charges for using the Electronic Bulletin Board (EBB) are set forth in SoCalGas' Rule 33. T T

2. Transportation nominations may be submitted manually or through the EBB. For each transportation nomination submitted manually, (by means other than the EBB such as facsimile transmittal), a processing charge of $11.87 shall be assessed. No processing charge will apply to an EBB subscriber for nominations submitted by fax at a time the EBB system is unavailable for use by the subscriber. T T T

3. Transportation nominations submitted via the EBB for the Timely Nomination cycle must be received by the Utility by 9:30 a.m. Pacific Clock Time one day prior to the flow date. Nominations submitted via fax must be received by the Utility by 8:30 a.m. Pacific Clock Time one day prior to the flow date. Nominations received after the nomination deadline will be processed after the nominations received before the nomination deadline. All nominations are considered original nominations and should be replaced to be changed. T

   Nominations submitted via the EBB for the Evening Nomination cycle must be received by the Utility by 4:00 p.m. Pacific Clock Time one day prior to the flow date. Nominations submitted via fax must be received by the Utility by 3:00 p.m. Pacific Clock Time one day prior to the flow date. T

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

C. Operational Requirements

3. (Continued)

Nominations submitted via the EBB for the Intraday 1 Nomination cycle must be received by the Utility by 8:00 a.m. Pacific Clock Time on the flow date. Nominations submitted via fax must be received by the Utility by 7:00 a.m. Pacific Clock Time on the flow date. T

Nominations submitted via the EBB for the Intraday 2 Nomination cycle must be received by the Utility by 3:00 p.m. Pacific Clock Time on the flow date. Nominations submitted via fax must be received by the Utility by 2:00 p.m. Pacific Clock Time on the flow date. T

Evening and Intraday nominations may be used to request an increase or decrease to scheduled volumes or a change to receipt or delivery points.

4. Where gas is transported by a shipper or agent to more than one customer of the Utility and the transporting pipeline's allocation to the shipper or agent is less than the shipper's or agent's requested quantity, such shipper or agent must allocate among its customers the total quantity of gas delivered each day to the Utility by the shipper or agent.

An allocation ranking must be submitted to the Utility no later than 3:00 p.m. Pacific Clock Time on the date of flow. An allocation ranking should be received for each flow date from each shipper. Agent rankings should be submitted along with the nominations.

If no allocation ranking is made by such shipper or agent by the due date and time, the Utility will use a pro rata allocation in allocating delivered quantities among the shipper's or agent's customers and the Utility's allocation of these quantities will prevail. The total quantity allocated among the customers of a shipper or agent during a month shall be adjusted by the Utility if necessary to match the actual monthly delivery to the Utility for the shipper or agent as reported by the transporting pipeline.

5. As between the customer and the Utility, the customer shall be deemed to be in control and possession of the gas to be delivered hereunder and responsible for any damage or injury caused thereby until the gas has been delivered at the point(s) of receipt. The Utility shall thereafter be deemed to be in control and possession of the gas after delivery to the Utility at the point(s) of receipt and shall be responsible for any damage or injury caused thereby until the same shall have been redelivered at the point(s) of delivery, unless the damage or injury has been caused by the quality of gas originally delivered to the Utility, for which the customer shall remain responsible.

6. Any penalties or charges incurred by the Utility under an interstate or intrastate supplier contract as a result of accommodating transportation service shall be paid by the responsible customer.

7. Customers receiving service from the Utility for the transportation of customer-owned gas shall pay any costs incurred by the Utility because of any failure by third parties to perform their obligations related to providing such service.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

D. Interruption of Service

1. The customer's priority and service level for transportation service shall be in accordance with Rule 14. If the customer's gas use is classified in more than one priority and/or service level, it is the customer's responsibility to inform the utility of the priority or priorities and service levels applicable to transportation service. Once established, such priorities cannot be changed during a curtailment period or more often than monthly except that service level 5 rates, which affect their curtailment status, may be changed as often as once per month.

2. The utility shall have the right, without liability, to interrupt the acceptance or redelivery of gas whenever it becomes necessary to test, alter, modify, enlarge or repair any facility or property comprising a part of, or appurtenant to, the utility's system or otherwise related to its operation. The utility will try to cause a minimum of inconvenience to the customer. Except in cases of unforeseen emergency, the utility shall give a minimum of ten (10) days advance written notice of such activity.

E. Nomination in Excess of System Capacity

1. In the event SoCalGas declares that the transportation nominations received for a specific date of gas flow ("flow date") exceeds its expected system capacity (including storage) on such flow date, SDG&E shall apply Buy-Back service under its Schedule G-IMB separately for each flow date that is overnominated. In such event, SDG&E shall follow the procedure set forth below.

2. SoCalGas shall notify all applicable customers that an excess nominations period shall be instituted. SoCalGas shall provide such notice via the EBB system. T

3. The excess nomination period shall begin on the flow date(s) indicated by SoCalGas. Customers shall be allowed to voluntarily reduce their nominations in response to the SoCalGas notification. Such nominations reductions must be received by SoCalGas' Gas Scheduling within two (2) business hours from the SoCalGas notification. If such voluntary reductions are adequate to bring the system into balance, the overnomination flow date will be canceled. Nomination reductions received after this deadline shall be considered received for the next day's nominations.

4. In the event customers fail to adequately reduce their transportation nominations, SDG&E shall reduce the nominations of those customers that SDG&E believes are contributing to the SoCalGas excess nominations problem. Nominations for customers without automated meter reading devices will be reduced to the maximum daily quantity specified for the customer (including core aggregation transportation groups). Those customers with automated meter reading devices will have their nominations reduces based on SDG&E's most recent and best available operating data.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

E. Nomination in Excess of System Capacity (Continued)

5. In cases where SDG&E reduces a customer's nomination under the above procedure and, as a result of such reduction, the customer uses Standby Procurement service under SDG&E's Schedule G-IMB in excess of the 10% tolerance band, the customer shall be allowed to additionally carryover the lesser of (1) the negative imbalance for the month in excess of the tolerance band, or (2) the amount of the customer's total involuntary nominations reductions for the month. Such additional carryover shall be applied to the customer's imbalance account at the conclusion of the imbalance trading period for the month in which the involuntary reduction occurred.

6. In accordance with the provisions of SDG&E's Schedule G-IMB, Buy-Back service shall be applied separately to each excess nominations day. For each such day, SDG&E shall apply the applicable Buy-Back rate to all of the customer's deliveries, less any firm storage injections made on behalf of the customer, for the designated flow date that are in excess of 110% of the customer's actual usage.

F. Winter Deliveries

The utility requires that customers deliver (using a combination of flowing supply and firm storage withdrawal) at least 50% of burn over a five day period from November through March. As the utility's total storage inventory declines through the winter, the delivery requirement becomes daily and increases to 70% or 90% depending on the level of inventory relative to peak day minimums.

1. From November 1 through March 31 customers are required to deliver (flowing supply and firm storage withdrawal) at a minimum of 50% of burn over a 5-day period. In other words, for each 5-day period, the utility will calculate the total burn and the total delivery. If the total delivery is less than 50% of the total burn, a daily balancing standby charge is applied. The daily balancing standby rate is 150% of the highest Southern California Border price during the five day period as published by Natural Gas Intelligence in "NGI's *Daily* Gas Price Index," including authorized franchise fees and uncollectible expenses (F&U) and brokerage fees. Imbalance trading and as-available withdrawals may not be used to offset the delivery minimums.

   a. "Burn" means usage and is defined as metered throughput or an estimated quantity such as Minimum Daily Quantity (MinDQ), as defined in Rule 1, for customers without automated meters.

   b. Example five-day periods are: Nov. 1 through Nov. 5, Nov. 6 through Nov. 10, Nov. 11 through Nov. 15 and so on. November with 30 days has six 5-day periods. December, January and March with 31 days have a 6-day period at the end of the month. February has a shortened 3 or 4-day period at the end of the month. The current 5-day period will run its course fully before the implementation of the 70% daily requirement. In the event that inventories rise above the 70% daily trigger levels by 1 Bcf, then a new, 5-day period will be implemented on the following day.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

F. Winter Deliveries

1. (Continued)

   c. Example calculations for determining volumes subject to the daily balancing standby rate are: if over 5 days, total burn is 500,000 therms and total deliveries (including firm withdrawal) are 240,000 therms, then 10,000 therms is subject to daily balancing standby rate. (50% times 500,000 minus 240,000 equals 10,000).

   d. Example calculations in using NGI's Daily Gas Price Index for determining the daily balancing standby rate are: If for Jan. 6 through Jan. 10 the NGI Southern California Border quoted price ranges are $2.36- 2.39, $2.36-2.44, $2.38-2.47, $2.36-2.42, and $2.37- 2.45, respectively, then the daily balancing standby rate becomes $3.71 ($2.47 times 150%).

   e. With the exception of weekends and holidays, the utility will use quotes from the NGI publication dated on the same day as the flow date. Weekend or holiday flow dates will use the first available publication date after the weekend or holiday.

2. When the SoCalGas total inventory in storage declines to the "peak day minimum + 20 Bcf trigger," the minimum daily delivery requirement increases to 70%. Customers are then required to be balanced (flowing supply plus firm storage withdrawal) at a minimum of 70% of burn on a daily basis. The 5-day period no longer applies since the system can no longer provide added flexibility. The daily balancing standby rate is 150% of the highest Southern California Border price per NGI's *Daily* Gas Price Index for the day (including authorized F&U and brokerage fees) and is applied to each day's deliveries which are less than the 70% requirement. In this regime as-available storage withdrawal is cut in half. All Hub activity contributing to the underdelivery situation (i.e., Hub deliveries greater than Hub receipts) is suspended.

   a. Peak day minimums are calculated annually before November 1 as part of normal winter operations planning. The peak day minimum is that level of total inventory that must be in storage to provide deliverability for the core 1-in-35 year peak day event, firm withdrawal commitments and noncore balancing requirement.

   b. Example calculations in this regime for determining volumes subject to the daily balancing standby rates are: If on January 6 total burn is 500,000 therms, and total deliveries (including firm withdrawal) are 300,000 therms then 50,000 therms is subject to the daily balancing standby charge (70% times 500,000 minus 300,000 equals 50,000).

   c. Example calculations in using NGI's Daily Gas Price Index for daily balancing standby rates in this regime are: if for January 6 and January 7, the NGI Southern California Border quoted price ranges are $2.36-2.39 and $2.36-2.44, then the daily balancing standby rates become $3.59 (150% of 2.39) for January 6, and $3.66 (150% times 2.44) for January 7, respectively.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

F. Winter Deliveries

3. When the total SoCalGas inventory in storage declines to the "peak day minimum + 5 Bcf trigger," the minimum daily delivery requirement increases to 90%. Customers are required to be balanced (flowing supply plus firm storage withdrawal) at a minimum of 90% of burn on a daily basis. Similar to the 70% regime the 5 day period no longer applies. The daily balancing standby rate is charged daily and is 150% of the highest Southern California Border price per NGI's *Daily* Gas Price Index for the day (including authorized F&U and brokerage fees). In this regime there are no as-available storage withdrawals. All Hub activity contributing to the underdelivery situation (i.e., Hub deliveries greater than Hub receipts) is suspended.

4. Information regarding the established peak day minimums, daily balancing trigger levels and SoCalGas total storage inventory levels will be made available to customers on a daily basis via the EBB and other customer notification media.

5. The utility will accept intra-day nominations to increase deliveries.

6. During the winter operating period, current rules for monthly balancing and monthly imbalance trading continue to apply. Volumes not in compliance with the 50%, 70% and 90% minimum delivery requirements, purchased at the daily balancing standby rate, are credited toward the monthly 90% delivery requirements. Daily balancing charges remain independent of monthly balancing charges. Daily balancing and monthly balancing charges are booked to the Purchased Gas Account (PGA). Schedule G-IMB provides details on monthly and daily balancing charges.

G. Accounting and Billing

1. Customer and utility acknowledge that on any operating day during the term hereof, utility may be redelivering quantities of gas being transported by utility to customer pursuant to other present or future supply arrangements, or transportation agreements. On any operating day when utility is both selling to customer and transporting gas for customer's account, the parties agree that the total quantities of gas shall be accounted for in accordance with the then-existing Rule 14 or succeeding rule. If there is no conflict with Rule 14, the quantities of gas shall be accounted for in the following order:

   a. First, to satisfy any minimum quantities under existing agreements.

   b. Second, after complete satisfaction of (a) then to any supply/exchange arrangements with the customer.

   c. Third, after the satisfaction of (a) and (b) then to the customer's transportation account under the Contract.

   d. All other accounts.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

G. Accounting and Billing

2. Customer agrees that it shall accept, and utility can rely upon for the purpose of accounting and billing, the allocation made by Customer's shipper as to the Quality and Quantity of Gas, expressed both in Mcf and Therms, delivered at each Point of Receipt hereunder during the preceding month for Customer's account. If the shipper does not make such an allocation, Customer agrees to accept the Quality and Quantity as determined by utility for purposes of billing and accounting. All quality and measurement calculations are subject to subsequent adjustment as defined in Section G.2.m of this Rule. Any other billing correction or adjustment made by Customer or third party for any prior billing period shall be based on rates or costs in effect when the event occurred and accounted for in the billing period they are reconciled.

3. Utility shall render to customer an invoice for the transportation services hereunder showing the quantities of gas, expressed in therms, delivered to utility for customer's account, at each point of receipt and the quantities of gas, expressed in therms, redelivered by utility for customer's account at each point of delivery during the preceding billing period. Customer shall pay such amounts due hereunder upon presentation of the bill, and in accordance with the provisions of Rule 9. In order to match interstate pipeline allocated calendar month delivery to usage, noncore transportion-only gas customers will be billed on a calendar month basis. Core transportation-only customers will remain in their regular billing cycle, but will have their average daily usage projected to a calendar month amount for the purpose of matching interstate pipeline allocated calendar month delivery. The calendar month usage projection will be trued-up in the next month based on that month's actual average daily usage.

4. Each party hereto shall have, at its expense, the right at all reasonable times, to examine the books and records of the other party to the extent necessary to verify the accuracy of any statement, charge, computation, or demand made under or pursuant to the Contract. Each party agrees to keep records and books of account in accordance with generally accepted accounting principles and practices in the industry.

H. Gas Quality

1. All gas delivered by the customer into the utility's system shall conform to the gas quality specifications as provided in any applicable agreements, contracts, service contracts and tariff schedules in effect between the delivering interstate or intrastate pipeline and the utility at the time of the delivery.

2. All gas delivered into the utility's system for the account of the customer for which there is no existing contract between the delivering pipeline and the utility shall be at a pressure such that the gas can be integrated into the utility's system at the point(s) of receipt and shall conform to the following minimum specifications:

   a. Heating Value: The minimum heating value is nine hundred and seventy (970) Btu (gross) per standard cubic feet on a dry basis.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

H. Gas Quality (Continued)

2. (Continued)

b. Moisture Content or Water Content: For gas delivered at or below a pressure of one thousand (1000) psig, the gas shall have a water content not in excess of seven (7) pounds per million standard cubic feet. For gas delivered at a pressure exceeding one thousand (1000) psig, the gas shall have a water dew point not exceeding 32 degrees F at delivery pressure.

c. Hydrogen Sulfide: The gas shall not contain more than twenty-five hundredths (0.25) of one (1) grain of hydrogen sulfide per one hundred (100) standard cubic feet. The gas shall not contain any entrained hydrogen sulfide treatment chemical (solvent) or its by-products in the gas steam.

d. Mercaptan Sulfur: The mercaptan sulfur is not to exceed three tenths (0.3) grains per hundred standard cubic feet.

e. Total Sulfur: The gas shall not contain more than seventy-five hundredths (0.75) of a grain of total sulfur compounds per one hundred (100) standard cubic feet. This includes COS and CS_2, hydrogen sulfide, mercaptans and mono, di and poly sulfides.

f. Carbon Dioxide: The gas shall not have a total carbon dioxide content in excess of three percent (3%) by volume.

g. Oxygen: The gas shall not at any time have an oxygen content in excess of two-tenths of one percent (0.2%) by volume, and customer will make every reasonable effort to keep the gas free of oxygen.

h. Inerts: The gas shall not at any time contain in excess of four percent (4%) total inerts (the total combined carbon dioxide, nitrogen, oxygen and any other inert compound) by volume.

i. Hydrocarbons: For gas delivered at a pressure of 400 psig or below, the gas hydrocarbon dew point is not to exceed 45 degrees F at the delivery pressure. For gas delivered at a pressure above 400 psig the gas hydrocarbon dew point is not to exceed 45 degrees F at a pressure of 400 psig.

j. Dust, Gums and Other Objectionable Matter: The gas shall be commercially free from dust, gums and other foreign substances.

k. Hazardous Substances: The gas must not contain hazardous substances (includes toxic and/or carcinogenic substances and/or reproductive toxins) concentrations which would prevent or restrict the normal marketing of gas, be injurious to pipeline facilities, or which would present a health and/or safety hazard to utility employees and/or the general public.

l. Delivery Temperature: The gas delivery temperature is not to be below 50 degrees F or above 105 degrees F.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

H. Gas Quality (Continued)

2. (Continued)

m. Interchangeability: The gas shall meet American Gas Association's Wobbe Number, Lifting Index, Flashback Index and Yellow Tip Index interchangeability indicies for high methane gas relative to a typical composition of gas in the utility system near the points of receipt. Acceptable specification ranges are:

* Wobbe Number (W for receiving facility)
(Wp for producer)
$0.9 \leq Wp \leq 1.1\ W$

* Lifting Index (I_L)

$I_L \leq 1.06$

* Flashback Index (I_F)

$I_F \leq 1.2$

* Yellow Tip Index (I_Y)

$I_Y \geq 0.8\ F$.

*Specifications are in relation to a typical composition of gas serving the area to be supplied by the new source.

I. Termination or Modification

1. If the customer does not deliver, for transportation at any point of receipt, a minimum of twenty thousand eight hundred (20,800) therms during any billing period in which the customer transports gas, or if the customer breaches any other terms and conditions of the Contract or applicable tariff schedule and does not correct the situation within thirty (30) days of notice, the utility shall have the right to cease service and immediately terminate the Contract. Either party may terminate the contract before expiration of its term if both parties so agree in writing.

2. If the Contract is terminated by mutual agreement, either party has the right to collect any quantities of gas or money due them for transportation service provided prior to the termination. Termination by mutual agreement is not a waiver of any remedy to which either party may be entitled for breach of the Contract.

(Continued)

RULE 30

TRANSPORTATION OF CUSTOMER-PROCURED GAS

J. Regulatory Requirements

1. Any gas transported by the utility for the customer which was first transported outside the State of California shall have first been authorized under Federal Energy Regulatory Commission (FERC) regulations as amended. Both parties recognize that such regulations only apply to pipelines subject to FERC jurisdiction, and do not apply to the utility. The customer shall not take any action which could subject the utility to the jurisdiction of the FERC, the Economic Regulatory Administration or any succeeding agency. Any such action shall be cause for immediate termination of the Contract.

2. Transportation service shall not begin until both parties have received and accepted any and all regulatory authorizations necessary for such service.

K. Warranty and Indemnification

1. Customer warrants to utility that customer has the right to deliver gas hereunder and that such gas is free from all liens and adverse claims of every kind. Customer will indemnify, defend and save utility harmless against all loss, damage, injury, liability and expense of any character where such loss, damage, injury, liability or expense arises directly or indirectly out of any demand, claim, action, cause of action or suit brought by any person, association or entity asserting ownership of or any interest in the gas tendered for transportation hereunder, or on account of royalties, payments or other charges applicable before or upon delivery of gas under the Contract.

2. Customer shall indemnify, defend and save harmless utility, its officers, agents, and employees from and against any and all loss, costs (including reasonable attorneys' fees), damage, injury, liability, and claims for injury or death of persons (including any employee of customer or utility), or for loss or damage to property (including the property of customer or utility), which occurs or is based upon an act or acts which occur while the gas is deemed to be in customer's control and possession or which results directly or indirectly from customer's performance of its obligations arising pursuant to the Contract, or occurs based on customer-owned gas not meeting the specifications of Section G. of this rule.

Daily Average (grains/100 scf)

Date	Rainbow30" TOS min	Rainbow30" TOS max	Rainbow30" TOS avg	Rainbow16" TOS min	Rainbow16" TOS max	Rainbow16" TOS avg
1/1/2006	0.047	0.065	0.057	0.046	0.062	0.056
1/2/2006	0.056	0.067	0.060	0.055	0.066	0.059
1/3/2006	0.049	0.060	0.054	0.048	0.060	0.053
1/4/2006	0.050	0.061	0.054	0.047	0.061	0.054
1/5/2006	0.049	0.065	0.058	0.047	0.064	0.057
1/6/2006	0.054	0.116	0.085	0.050	0.117	0.082
1/7/2006	0.055	0.083	0.066	0.054	0.080	0.064
1/8/2006	0.051	0.121	0.067	0.051	0.120	0.066
1/9/2006	0.041	0.069	0.056	0.039	0.067	0.055
1/10/2006	0.052	0.063	0.058	0.051	0.062	0.057
1/11/2006	0.038	0.074	0.059	0.046	0.072	0.060
1/12/2006	0.044	0.094	0.063	0.049	0.093	0.063
1/13/2006	0.049	0.053	0.051	0.048	0.052	0.050
1/14/2006	0.053	0.070	0.061	0.051	0.070	0.060
1/15/2006	0.056	0.063	0.060	0.057	0.065	0.060
1/16/2006	0.056	0.062	0.058	0.055	0.061	0.058
1/17/2006	0.052	0.066	0.059	0.051	0.065	0.058
1/18/2006	0.051	0.079	0.065	0.051	0.077	0.064
1/19/2006	0.058	0.069	0.063	0.058	0.066	0.062
1/20/2006	0.062	0.069	0.065	0.060	0.068	0.064
1/21/2006	0.058	0.070	0.062	0.057	0.067	0.061
1/22/2006	0.054	0.071	0.063	0.053	0.070	0.063
1/23/2006	0.039	0.067	0.058	0.051	0.066	0.060
1/24/2006	0.042	0.056	0.049	0.040	0.055	0.049
1/25/2006	0.040	0.066	0.055	0.038	0.065	0.054
1/26/2006	0.042	0.068	0.060	0.044	0.066	0.059
1/27/2006	0.047	0.064	0.056	0.046	0.063	0.055
1/28/2006	0.053	0.067	0.062	0.052	0.067	0.060
1/29/2006	0.057	0.069	0.062	0.055	0.067	0.061
1/30/2006	0.059	0.065	0.062	0.057	0.066	0.061
1/31/2006	0.061	0.071	0.067	0.060	0.071	0.066
2/1/2006	0.057	0.065	0.060	0.056	0.063	0.059
2/2/2006	0.060	0.070	0.064	0.059	0.070	0.064
2/3/2006	0.064	0.072	0.067	0.054	0.071	0.066
2/4/2006	0.062	0.068	0.065	0.060	0.067	0.064
2/5/2006	0.062	0.071	0.067	0.060	0.071	0.066
2/6/2006	0.041	0.071	0.061	0.055	0.072	0.062
2/7/2006	0.059	0.072	0.066	0.061	0.073	0.066
2/8/2006	0.054	0.068	0.061	0.055	0.067	0.062
2/9/2006	0.056	0.074	0.067	0.055	0.071	0.066
2/10/2006	0.068	0.074	0.071	0.069	0.076	0.071
2/11/2006	0.065	0.072	0.068	0.064	0.071	0.068
2/12/2006	0.065	0.073	0.069	0.066	0.072	0.069
2/13/2006	0.066	0.072	0.069	0.065	0.072	0.069
2/14/2006	0.054	0.073	0.068	0.066	0.071	0.068
2/15/2006	0.062	0.068	0.065	0.062	0.067	0.065
2/16/2006	0.055	0.063	0.059	0.055	0.062	0.059
2/17/2006	0.055	0.063	0.060	0.056	0.064	0.060
2/18/2006	0.054	0.066	0.059	0.054	0.065	0.059

Daily Average (grains/100 scf)

Date	Rainbow30" TOS min	Rainbow30" TOS max	Rainbow30" TOS avg	Rainbow16" TOS min	Rainbow16" TOS max	Rainbow16" TOS avg
2/19/2006	0.062	0.069	0.066	0.063	0.069	0.066
2/20/2006	0.061	0.069	0.066	0.061	0.069	0.066
2/21/2006	0.062	0.070	0.066	0.063	0.068	0.066
2/22/2006	0.062	0.070	0.067	0.063	0.068	0.066
2/23/2006	0.063	0.069	0.067	0.062	0.069	0.067
2/24/2006	0.061	0.072	0.066	0.063	0.070	0.066
2/25/2006	0.066	0.072	0.069	0.066	0.072	0.069
2/26/2006	0.064	0.072	0.068	0.062	0.071	0.068
2/27/2006	0.057	0.064	0.062	0.057	0.066	0.062
2/28/2006	0.058	0.071	0.067	0.059	0.071	0.067
3/1/2006	0.057	0.071	0.063	0.057	0.071	0.063
3/2/2006	0.056	0.064	0.060	0.056	0.063	0.060
3/3/2006	0.057	0.062	0.060	0.057	0.062	0.060
3/4/2006	0.054	0.068	0.061	0.055	0.068	0.061
3/5/2006	0.056	0.063	0.060	0.057	0.063	0.060
3/6/2006	0.057	0.064	0.060	0.058	0.064	0.060
3/7/2006	0.059	0.067	0.062	0.059	0.068	0.063
3/8/2006	0.058	0.065	0.062	0.058	0.065	0.062
3/9/2006	0.058	0.072	0.066	0.057	0.072	0.066
3/10/2006	0.057	0.072	0.066	0.057	0.071	0.066
3/11/2006	0.023	0.062	0.043	0.025	0.063	0.043
3/12/2006	0.021	0.100	0.074	0.022	0.102	0.074
3/13/2006	0.053	0.094	0.074	0.053	0.091	0.074
3/14/2006	0.054	0.093	0.073	0.055	0.092	0.073
3/15/2006	0.053	0.082	0.067	0.054	0.083	0.068
3/16/2006	0.034	0.079	0.065	0.049	0.081	0.067
3/17/2006	0.056	0.077	0.065	0.057	0.078	0.064
3/18/2006	0.056	0.076	0.067	0.056	0.079	0.067
3/19/2006	0.048	0.073	0.060	0.052	0.073	0.060
3/20/2006	0.050	0.071	0.061	0.051	0.077	0.063
3/21/2006	0.053	0.074	0.067	0.055	0.073	0.066
3/22/2006	0.064	0.076	0.069	0.065	0.074	0.069
3/23/2006	0.037	0.121	0.097	0.071	0.127	0.101
3/24/2006	0.078	0.118	0.087	0.079	0.122	0.087
3/25/2006	0.074	0.094	0.081	0.075	0.090	0.082
3/26/2006	0.070	0.082	0.076	0.068	0.085	0.077
3/27/2006	0.069	0.083	0.077	0.070	0.084	0.077
3/28/2006	0.069	0.086	0.078	0.073	0.086	0.079
3/29/2006	0.067	0.082	0.074	0.068	0.082	0.074
3/30/2006	0.070	0.088	0.079	0.063	0.093	0.078
3/31/2006	0.062	0.085	0.077	0.068	0.087	0.078
4/1/2006	0.060	0.081	0.073	0.063	0.081	0.073
4/2/2006	0.065	0.093	0.079	0.071	0.093	0.078
4/3/2006	0.072	0.090	0.080	0.069	0.092	0.081
4/4/2006	0.074	0.088	0.080	0.075	0.087	0.080
4/5/2006	0.067	0.079	0.074	0.069	0.079	0.074
4/6/2006	0.072	0.087	0.080	0.071	0.090	0.080
4/7/2006	0.077	0.086	0.080	0.071	0.086	0.079
4/8/2006	0.074	0.085	0.079	0.073	0.085	0.079

Daily Average (grains/100 scf)

Date	Rainbow30" TOS min	Rainbow30" TOS max	Rainbow30" TOS avg	Rainbow16" TOS min	Rainbow16" TOS max	Rainbow16" TOS avg
4/9/2006	0.071	0.081	0.075	0.072	0.080	0.077
4/10/2006	0.071	0.085	0.077	0.070	0.086	0.076
4/11/2006	0.069	0.089	0.078	0.072	0.086	0.079
4/12/2006	0.041	0.077	0.060	0.037	0.078	0.061
4/13/2006	0.065	0.083	0.076	0.067	0.085	0.077
4/14/2006	0.069	0.083	0.075	0.070	0.079	0.074
4/15/2006	0.068	0.078	0.073	0.068	0.080	0.073
4/16/2006	0.070	0.084	0.075	0.068	0.084	0.075
4/17/2006	0.066	0.081	0.074	0.067	0.080	0.071
4/18/2006	0.072	0.083	0.076	0.068	0.084	0.075
4/19/2006	0.051	0.077	0.067	0.050	0.075	0.068
4/20/2006	0.066	0.076	0.071	0.063	0.076	0.070
4/21/2006	0.064	0.080	0.070	0.063	0.072	0.069
4/22/2006	0.064	0.074	0.069	0.063	0.074	0.069
4/23/2006	0.064	0.075	0.068	0.062	0.073	0.067
4/24/2006	0.061	0.076	0.066	0.063	0.075	0.067
4/25/2006	0.065	0.075	0.068	0.063	0.074	0.068
4/26/2006	0.058	0.070	0.066	0.057	0.073	0.065
4/27/2006	0.061	0.069	0.066	0.061	0.070	0.065
4/28/2006	0.062	0.075	0.068	0.062	0.074	0.068
4/29/2006	0.063	0.080	0.070	0.062	0.076	0.068
4/30/2006	0.061	0.079	0.070	0.060	0.078	0.069
5/1/2006	0.058	0.073	0.065	0.059	0.069	0.063
5/2/2006	0.065	0.078	0.070	0.062	0.076	0.069
5/3/2006	0.061	0.074	0.067	0.059	0.072	0.067
5/4/2006	0.061	0.077	0.066	0.061	0.075	0.067
5/5/2006	0.061	0.073	0.066	0.061	0.074	0.066
5/6/2006	0.059	0.070	0.064	0.058	0.071	0.065
5/7/2006	0.060	0.071	0.065	0.060	0.072	0.064
5/8/2006	0.061	0.069	0.065	0.058	0.072	0.065
5/9/2006	0.060	0.071	0.065	0.061	0.075	0.066
5/10/2006	0.025	0.075	0.064	0.052	0.074	0.065
5/11/2006	0.060	0.071	0.066	0.063	0.073	0.068
5/12/2006	0.063	0.077	0.067	0.061	0.074	0.067
5/13/2006	0.059	0.074	0.065	0.059	0.075	0.065
5/14/2006	0.061	0.072	0.067	0.061	0.075	0.066
5/15/2006	0.060	0.079	0.067	0.058	0.074	0.064
5/16/2006	0.050	0.080	0.065	0.047	0.076	0.064
5/17/2006	0.044	0.073	0.057	0.043	0.075	0.058
5/18/2006	0.049	0.139	0.113	0.049	0.138	0.112
5/19/2006	0.137	0.178	0.163	0.136	0.174	0.162
5/20/2006	0.065	0.161	0.089	0.065	0.161	0.087
5/21/2006	0.072	0.090	0.079	0.071	0.086	0.079
5/22/2006	0.056	0.081	0.068	0.060	0.083	0.072
5/23/2006	0.061	0.161	0.134	0.069	0.167	0.138
5/24/2006	0.128	0.166	0.142	0.126	0.167	0.144
5/25/2006	0.127	0.160	0.141	0.126	0.155	0.140
5/26/2006	0.122	0.153	0.135	0.123	0.149	0.135
5/27/2006	0.059	0.135	0.071	0.059	0.135	0.072

Daily Average (grains/100 scf)

Date	Rainbow30" TOS min	Rainbow30" TOS max	Rainbow30" TOS avg	Rainbow16" TOS min	Rainbow16" TOS max	Rainbow16" TOS avg
5/28/2006	0.059	0.077	0.069	0.061	0.080	0.071
5/29/2006	0.069	0.173	0.135	0.067	0.158	0.135
5/30/2006	0.133	0.168	0.145	0.127	0.161	0.144
5/31/2006	0.131	0.166	0.144	0.126	0.162	0.143
6/1/2006	0.131	0.165	0.145	0.133	0.158	0.144
6/2/2006	0.128	0.166	0.144	0.125	0.161	0.140
6/3/2006	0.067	0.138	0.080	0.067	0.139	0.080
6/4/2006	0.058	0.078	0.071	0.064	0.077	0.071
6/5/2006	0.069	0.150	0.133	0.073	0.149	0.133
6/6/2006	0.061	0.141	0.073	0.058	0.140	0.074
6/7/2006	0.065	0.157	0.133	0.065	0.154	0.132
6/8/2006	0.067	0.151	0.081	0.066	0.156	0.081
6/9/2006	0.067	0.159	0.132	0.061	0.150	0.133
6/10/2006	0.068	0.155	0.082	0.066	0.154	0.081
6/11/2006	0.065	0.079	0.071	0.061	0.077	0.070
6/12/2006	0.063	0.081	0.071	0.060	0.079	0.070
6/13/2006	0.060	0.077	0.066	0.059	0.076	0.067
6/14/2006	0.064	0.078	0.069	0.059	0.076	0.067
6/15/2006		0.078	0.057		0.079	0.062
6/16/2006	0.054	0.083	0.074	0.065	0.082	0.074
6/17/2006	0.069	0.160	0.133	0.071	0.155	0.134
6/18/2006	0.125	0.150	0.140	0.119	0.156	0.138
6/19/2006	0.061	0.141	0.075	0.062	0.140	0.074
6/20/2006	0.061	0.078	0.067	0.061	0.076	0.067
6/21/2006	0.065	0.155	0.131	0.064	0.152	0.128
6/22/2006	0.131	0.167	0.146	0.127	0.160	0.147
6/23/2006	0.069	0.146	0.081	0.067	0.149	0.080
6/24/2006	0.063	0.084	0.073	0.062	0.078	0.070
6/25/2006	0.064	0.081	0.072	0.064	0.079	0.072
6/26/2006	0.063	0.079	0.070	0.062	0.079	0.069
6/27/2006		0.079	0.059		0.079	0.061
6/28/2006	0.061	0.078	0.070	0.061	0.078	0.070
6/29/2006	0.064	0.081	0.071	0.064	0.082	0.070
6/30/2006	0.057	0.078	0.070	0.063	0.077	0.071
7/1/2006	0.062	0.074	0.069	0.060	0.080	0.070
7/2/2006	0.061	0.076	0.068	0.063	0.077	0.069
7/3/2006	0.062	0.079	0.070	0.060	0.075	0.068
7/4/2006	0.064	0.077	0.071	0.066	0.081	0.072
7/5/2006	0.065	0.081	0.072	0.064	0.079	0.071
7/6/2006	0.063	0.082	0.071	0.061	0.078	0.071
7/7/2006	0.065	0.084	0.073	0.063	0.079	0.072
7/8/2006	0.068	0.084	0.076	0.064	0.085	0.073
7/9/2006	0.068	0.082	0.073	0.064	0.082	0.071
7/10/2006	0.065	0.080	0.072	0.064	0.078	0.070
7/11/2006	0.064	0.081	0.070	0.065	0.077	0.069
7/12/2006	0.063	0.080	0.072	0.066	0.078	0.071
7/13/2006	0.064	0.080	0.070	0.065	0.075	0.070
7/14/2006	0.061	0.075	0.070	0.062	0.080	0.071
7/15/2006	0.066	0.080	0.071	0.063	0.079	0.069

Daily Average (grains/100 scf)

Date	Rainbow30" TOS min	Rainbow30" TOS max	Rainbow30" TOS avg	Rainbow16" TOS min	Rainbow16" TOS max	Rainbow16" TOS avg
7/16/2006	0.066	0.077	0.071	0.062	0.077	0.069
7/17/2006	0.063	0.080	0.070	0.064	0.075	0.069
7/18/2006	0.058	0.082	0.070	0.058	0.082	0.070
7/19/2006	0.061	0.085	0.079	0.060	0.084	0.078
7/20/2006	0.060	0.081	0.071	0.059	0.081	0.071
7/21/2006	0.058	0.081	0.072	0.058	0.084	0.073
7/22/2006	0.068	0.086	0.077	0.071	0.087	0.079
7/23/2006	0.062	0.081	0.068	0.061	0.081	0.068
7/24/2006		0.064	0.037		0.064	0.037
7/25/2006	0.036	0.079	0.068	0.038	0.085	0.070
7/26/2006	0.060	0.084	0.070	0.060	0.083	0.069
7/27/2006	0.064	0.076	0.069	0.063	0.074	0.068
7/28/2006	0.063	0.075	0.068	0.062	0.076	0.066
7/29/2006	0.062	0.074	0.066	0.060	0.073	0.065
7/30/2006	0.059	0.069	0.065	0.052	0.069	0.062
7/31/2006	0.059	0.073	0.066	0.062	0.069	0.065
8/1/2006	0.059	0.073	0.066	0.061	0.073	0.064
8/2/2006	0.060	0.072	0.066	0.060	0.073	0.065
8/3/2006	0.063	0.093	0.078	0.060	0.093	0.077
8/4/2006	0.064	0.090	0.070	0.061	0.090	0.069
8/5/2006	0.056	0.072	0.063	0.057	0.070	0.062
8/6/2006	0.059	0.069	0.063	0.057	0.070	0.062
8/7/2006	0.060	0.075	0.067	0.058	0.071	0.065
8/8/2006	0.062	0.076	0.068	0.059	0.074	0.066
8/9/2006	0.058	0.080	0.069	0.058	0.081	0.067
8/10/2006	0.064	0.087	0.074	0.061	0.082	0.072
8/11/2006	0.063	0.080	0.071	0.063	0.082	0.071
8/12/2006	0.063	0.080	0.071	0.061	0.082	0.070
8/13/2006	0.057	0.071	0.064	0.055	0.072	0.063
8/14/2006	0.058	0.070	0.062	0.056	0.067	0.061
8/15/2006	0.059	0.072	0.066	0.058	0.070	0.064
8/16/2006	0.061	0.094	0.072	0.058	0.088	0.069
8/17/2006	0.048	0.083	0.066	0.060	0.083	0.066
8/18/2006	0.034	0.071	0.053	0.043	0.064	0.052
8/19/2006	0.046	0.084	0.067	0.048	0.079	0.065
8/20/2006	0.059	0.083	0.068	0.058	0.074	0.066
8/21/2006	0.059	0.076	0.067	0.058	0.072	0.065
8/22/2006	0.061	0.071	0.066	0.058	0.072	0.065
8/23/2006	0.062	0.081	0.071	0.062	0.078	0.069
8/24/2006	0.060	0.079	0.070	0.060	0.079	0.069
8/25/2006	0.055	0.089	0.074	0.066	0.084	0.072
8/26/2006	0.060	0.077	0.067	0.059	0.077	0.066
8/27/2006	0.061	0.075	0.067	0.061	0.070	0.065
8/28/2006	0.057	0.074	0.066	0.057	0.078	0.066
8/29/2006	0.061	0.072	0.067	0.059	0.072	0.065
8/30/2006	0.062	0.075	0.069	0.060	0.078	0.066
8/31/2006	0.060	0.162	0.079	0.060	0.290	0.087
9/1/2006	0.061	0.076	0.070	0.066	0.076	0.070
9/2/2006	0.056	0.073	0.065	0.056	0.068	0.063

Daily Average (grains/100 scf)

Date	Rainbow30" TOS min	Rainbow30" TOS max	Rainbow30" TOS avg	Rainbow16" TOS min	Rainbow16" TOS max	Rainbow16" TOS avg
9/3/2006	0.050	0.072	0.061	0.052	0.076	0.060
9/4/2006	0.052	0.065	0.059	0.050	0.066	0.059
9/5/2006	0.058	0.075	0.066	0.057	0.072	0.065
9/6/2006	0.060	0.077	0.068	0.057	0.073	0.065
9/7/2006	0.052	0.075	0.068	0.063	0.075	0.068
9/8/2006	0.054	0.081	0.068	0.052	0.077	0.067
9/9/2006	0.063	0.081	0.070	0.059	0.082	0.069
9/10/2006	0.053	0.067	0.058	0.051	0.068	0.056
9/11/2006	0.056	0.067	0.060	0.054	0.064	0.059
9/12/2006	0.055	0.068	0.062	0.057	0.066	0.061
9/13/2006	0.058	0.072	0.063	0.056	0.067	0.061
9/14/2006	0.058	0.068	0.063	0.059	0.068	0.063
9/15/2006	0.052	0.077	0.064	0.056	0.071	0.064
9/16/2006	0.055	0.069	0.062	0.056	0.070	0.061
9/17/2006	0.054	0.066	0.060	0.055	0.065	0.059
9/18/2006	0.046	0.068	0.060	0.052	0.066	0.059
9/19/2006		0.065	0.035		0.065	0.035
9/20/2006		0.077	0.057		0.191	0.081
9/21/2006	0.043	0.078	0.065	0.047	0.077	0.064
9/22/2006	0.067	0.082	0.072	0.064	0.080	0.071
9/23/2006	0.043	0.072	0.065	0.043	0.071	0.063
9/24/2006	0.041	0.075	0.065	0.029	0.073	0.064
9/25/2006	0.038	0.071	0.062	0.027	0.069	0.060
9/26/2006	0.054	0.068	0.062	0.046	0.067	0.061
9/27/2006	0.060	0.071	0.068	0.060	0.070	0.066
9/28/2006	0.058	0.069	0.064	0.057	0.067	0.063
9/29/2006	0.065	0.076	0.069	0.064	0.073	0.068
9/30/2006	0.056	0.068	0.063	0.055	0.067	0.062

MIN	0.021
MAX	0.290
AVG	0.072

The enclosed is provided for information purposes only. SDGE has made reasonable efforts to ensure all information is correct and consistent with the applicable Tariffs. To the extent there is any conflict with the Tariffs, the Tariffs shall govern in all cases. In addition, neither SDG&E's publication nor verbal representations thereof constitutes any statement, recommendation, endorsement, approval or guaranty (either express or implied) of any product or service. Moreover, SDG&E shall not be responsible for errors or omissions in this publication, for claims or damages relating to the use thereof, even if it has been advised of the possibility of such damages.

Fuel Usage
South Bay Power Plant
2004-2005

South Bay Power Plant										
	Unit 1		Unit 2		Unit 3		Unit 4		CT	
Quarter	Oil (Barrels)	Gas (mcf)	Oil (Barrels)	Gas (mcf)	Oil (Barrels)	Gas (mcf)	Oil (Barrels)	Gas (mcf)	Oil (Barrels)	Gas (mcf)
Jan-Mar 2004	-	201,931	-	1,418,445	-	1,831,255	-	733,417	1,046	-
Apr-Jun 2004	-	1,406,348	-	1,253,378	-	976,106	-	1,018,283	209	-
Jul-Sep 2004	-	1,838,479	-	1,755,935	-	1,362,460	-	920,622	638	-
Oct-Dec 2004	-	1,934,150.0	-	1,850,773	-	1,543,364	-	255,971	2,165	-
Jan-Mar 2005	648	1,919,339	375	1,543,646	467	1,472,167	908	615,508	1,088	-
Apr-Jun 2005	-	1,603,784	-	1,217,156	-	767,726	-	558,487	73	-
Jul-Sep 2005	-	818,480	-	1,090,070	-	1,199,901	-	228,718	513	-
Oct-Dec 2005	-	1,240,664	-	600,053	76	1,212,630	-	217,024	168	-

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

CONTROL NO.
274864

PERMIT NO
000794
EXPIRES
MARCH 2007

PERMIT TO OPERATE

THE FOLLOWING IS HEREBY GRANTED A PERMIT TO OPERATE THE ARTICLE,MACHINE,EQUIPMENT OR CONTRIVANCE DESCRIBED BELOW. THIS PERMIT IS NOT TRANSFERABLE TO A NEW OWNER NOR IS IT VALID FOR OPERATION OF THE EQUIPMENT AT ANOTHER LOCATION, EXCEPT AS SPECIFIED. THIS PERMIT TO OPERATE OR A COPY MUST BE POSTED ON OR WITHIN 25 FEET OF THE OF THE EQUIPMENT, OR READILY AVAILABLE, ON THE OPERATING PREMISES.

PERMITTEE
LSP SOUTH BAY LLC
JIM NYLANDER
990 BAY BL
CHULA VISTA CA 91911-1651

EQUIPMENT ADDRESS
LSP SOUTH BAY LLC
990 BAY BL
CHULA VISTA CA 91911-0000

EQUIPMENT DESCRIPTION REVISED COPY
ONE (1) UTILITY BOILER, UNIT 1
MANUFACTURER: BABCOCK & WILCOX
SERIAL NO.: 23001-60
SPECIFICATIONS: 1550 MM BTU/HR INPUT; RESIDUAL OIL AND/OR NATURAL GAS FIRED. GRASEBY/STI CEM SYSTEM & ASSOCIATED SOFTWARE. ONE BABCOCK & WILCOX IN-DUCT PLATE SELECTIVE CATALYTIC REDUCTION SYSTEM, ASSOCIATED AMMONIA INJECTION SYSTEM AND EVAPORATION SKID, MONITORING EQUIPMENT, AND ANCILLARY EQUIPMENT.(BOILER HAS WATER INJECTION AND STEAM INJECTION CAPABILITY) 973261 4/99 975641 EAD 6/5/03

Sector#:17 ID#:00334A PO#:000794 BEC#:12581
Fee Schedules: 13D01 92G01 92I01

EVERY PERSON WHO OWNS OR OPERATES THIS EQUIPMENT IS REQUIRED TO COMPLY WITH THE CONDITIONS LISTED BELOW AND ALL APPLICABLE REQUIREMENTS AND DISTRICT RULES, INCLUDING BUT NOT LIMITED TO RULE(S) 19.2, 53, 62, 68, 69.

FAILURE TO OPERATE IN COMPLIANCE IS A MISDEMEANOR SUBJECT TO CIVIL AND CRIMINAL PENALTIES.

A. FEDERALLY-ENFORCEABLE AND DISTRICT-ENFORCEABLE CONDITIONS

1. THE PERMITTEE SHALL COMPLY WITH RULE(S) 19.2, 50, 51, 53, 62, AND 68.
   RULE(S):1421.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND OPERATED IN ACCORDANCE WITH GOOD AIR POLLUTION CONTROL PRACTICES AT ALL TIMES.
   RULE(S):21.

3. THE PERMITTEE SHALL MAINTAIN THE STACK GAS PH AT 5.0 OR GREATER WHEN LIQUID FUEL IS BURNED. A 45.0 WT.% TO 55.0 WT.% CALCIUM NITRATE AQUEOUS SOLUTION, OR A 36.5 WT. % TO 46.5 WT. % MAGNESIUM OXIDE

PERMIT TO OPERATE

SLURRY, SHALL BE USED AS A FUEL ADDITIVE TO ENSURE STACK PH IS 5.0 OR GREATER. COMPLIANCE WITH THE WEIGHT PERCENT CONCENTRATION LIMITS MAY BE DEMONSTRATED BY MANUFACTURER'S CERTIFICATION FOR EACH DELIVERY. FUEL ADDITIVES AT HIGHER OR LOWER CONCENTRATION MAY BE USED IF PRIOR WRITTEN APPROVAL IS GRANTED BY THE DISTRICT. A MATERIAL SAFETY DATA SHEET OF EACH ADDITIVE AND EACH MANUFACTURER CERTIFICATION OF THE CONCENTRATION SHALL BE MAINTAINED ON SITE AND A COPY SHALL BE PROVIDED TO THE DISTRICT UPON REQUEST. IF LIQUID FUEL WILL BE BURNED FOR 24 CONSECUTIVE HOURS OR MORE, STACK GAS PH SHALL BE MEASURED IN ACCORDANCE WITH A DISTRICT APPROVED TEST METHOD, WITHIN THAT PERIOD AND ONCE WITHIN EVERY 24-HOUR PERIOD THEREAFTER UNTIL LIQUID FUEL IS NO LONGER BURNED.
RULE(S):51.

4.CON'T FROM ABOVE
IF LIQUID FUEL WILL
BE BURNED FOR LESS THAN 24 CONSECUTIVE HOURS BUT MORE THAN 12 CONSECUTIVE HOURS, STACK GAS PH SHALL BE MEASURED IN ACCORDANCE WITH INSTRUCTION NO. 5.240.0 REV. NO. 0, "RELATIVE ACIDITY MEASUREMENT (STACK GAS TESTING) IN THE "SDG&E OPERATING SYSTEMS ANALYSIS PROCEDURES MANUAL," OR WITH AN ALTERNATIVE DISTRICT-APPROVED TEST METHOD, AS SOON AS PRACTICAL AFTER THE CONCLUSION OF THE BURN BUT NOT LATER THAN 24 HOURS FROM THE BEGINNING OF THE OIL BURN. THE PERMITTEE SHALL MAINTAIN A COPY OF THE APPROVED TEST METHOD ON SITE AND MAKE IT AVAILABLE TO THE DISTRICT UPON REQUEST. THE STACK GAS PH, DATE, TIME, AND TEST METHOD USED FOR THE MEASUREMENT SHALL BE RECORDED FOR EACH MEASUREMENT.
RULE(S):51.

5. LIQUID FUEL SULFUR CONTENT SHALL NOT EXCEED 0.5% SULFUR BY WEIGHT AT THE BURNER TIP.
RULE(S):62.

6. THE PERMITTEE SHALL NOTIFY THE AIR POLLUTION CONTROL DISTRICT OF EACH FORMAL DAMAGE CLAIM THAT CAN BE ASSOCIATED WITH ACID FALLOUT WITHIN TEN (10) DAYS OF EACH SUCH OCCURRENCE.
RULE(S):51.

7. ALL SOURCE TESTS REQUIRED FOR THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT:

A. FOR MEASUREMENTS OF OXIDES OF NITROGEN AND STACK GAS OXYGEN CONTENT THE SOURCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH DISTRICT METHOD 100, "TEST PROCEDURES FOR THE

PERMIT TO OPERATE

DETERMINATION OF NOX, CO, AND DILUENT GASES BY CONTINUOUS EMISSION MONITORING," DATED MAY 1995,AS APPROVED BY THE EPA, AND EPA METHOD 7E, DETERMINATION OF NITROGEN OXIDES EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA, AND THE APPLICABLE PROVISIONS SPECIFIED IN 40 CFR PART 75.
RULE(S):21, 69, 40 CFR PART 75.

8.CON'T FROM ABOVE

B. FOR MEASUREMENTS OF AMMONIA, THE SOURCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH BAY AREA AIR QUALITY MANAGEMENT DISTRICT (BAAQMD) METHOD ST-1B, "AMMONIA, CONTINUOUS SAMPLING," DATED JANUARY 20, 1982, AS APPROVED BY THE EPA OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.

C. SOURCE TESTING SHALL BE PERFORMED AT NO LESS THAN 80% OF THE BOILER RATING OR IN ACCORDANCE WITH THE SOURCE TEST LOAD REQUIREMENTS OF 40 CFR PART 75.
RULE(S):40 CFR PART 75, 21, 69.

9.CON'T FROM ABOVE

MEASUREMENTS OF OXIDES OF NITROGEN, STACK GAS OXYGEN CONTENT, AND AMMONIA SHALL BE MADE CONCURRENTLY.

FOR EACH SOURCE TEST, A SOURCE TEST PROTOCOL SHALL BE SUBMITTED TO THE DISTRICT FOR WRITTEN APPROVAL AT LEAST 30 DAYS PRIOR TO THE DATE OF THE SOURCE TEST AND, WITHIN 30 DAYS AFTER COMPLETION OF THE SOURCE TEST, A FINAL TEST REPORT SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL, UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT.
RULE(S):21, 69, 40 CFR PART 75.

10. EXCEPT FOR CHANGES THAT ARE SPECIFIED IN THE INITIAL APPROVED NOX MONITORING PROTOCOL OR A SUBSEQUENT REVISION TO THAT PROTOCOL THAT IS APPROVED IN ADVANCE, IN WRITING, BY THE DISTRICT, THE DISTRICT SHALL BE NOTIFIED IN WRITING AT LEAST THIRTY (30) DAYS PRIOR TO ANY PLANNED CHANGES MADE IN THE CEMS/DAHS (INCLUDING THE PROGRAMMABLE LOGIC CONTROLLER) SOFTWARE WHICH AFFECTS THE VALUE OF DATA DISPLAYED ON THE CEMS/DAHS MONITORS WITH RESPECT TO THE PARAMETERS MEASURED BY THEIR RESPECTIVE SENSING DEVICES OR ANY PLANNED CHANGES TO THE SOFTWARE THAT CONTROLS THE AMMONIA FLOW TO THE SCR. UNPLANNED OR EMERGENCY CHANGES SHALL BE REPORTED TO THE DISTRICT WITHIN 96 HOURS.
RULE(S):21.

11. THIS EQUIPMENT SHALL ONLY BE FIRED WITH NATURAL GAS EXCEPT THAT LIQUID

PERMIT TO OPERATE

FUEL MAY BE FIRED WHEN NATURAL GAS IS NOT AVAILABLE DUE TO A FORCE MAJEURE NATURAL GAS CURTAILMENT, AS DEFINED BY DISTRICT RULE 69, AND LIQUID FUEL MAY BE FIRED UP TO A TOTAL OF 160 HOURS IN A CALENDAR YEAR FOR OPERATIONAL AND RELIABILITY TESTING AND FOR COMPLIANCE EMISSIONS TESTING REQUIRED BY THE DISTRICT.
RULE(S):CEQA.

12. THE CEMS TO MONITOR NOX AND O2 REQUIRED BY THIS PERMIT SHALL MEET ALL THE APPLICABLE PERFORMANCE, INSTALLATION, CERTIFICATION, AND QUALITY ASSURANCE AND QUALITY CONTROL PROVISIONS SPECIFIED IN 40 CFR PART 75 APPENDICES A AND B AND BE OPERATED IN ACCORDANCE WITH 40 CFR PART 60.13. FUEL FLOW MONITORS REQUIRED BY THIS PERMIT SHALL MEET ALL APPLICABLE PERFORMANCE, INSTALLATION, CERTIFICATION, CALIBRATION, AND QUALITY ASSURANCE AND QUALITY CONTROL PROVISIONS SPECIFIED IN OF 40 CFR PART 75.
RULE(S):TITLE IV, 40 CFR PART 75, 21, 69.

13. NOX EMISSION LIMIT CONDITION. EXCEPT AS PROVIDED BELOW, FOR EACH CALENDAR DAY, THE AVERAGE MASS EMISSION RATE OF NOX PER UNIT OF ELECTRICAL ENERGY GENERATED FROM THIS EQUIPMENT WHEN FIRED ON EITHER NATURAL GAS, LIQUID FUEL, OR A COMBINATION OF BOTH SHALL NOT EXCEED THE RULE 69 NOX EMISSION LIMIT, IN POUNDS PER GROSS MEGAWATT-HOUR AVERAGED, OVER EACH CALENDAR DAY OF OPERATION. THE RULE 69 NOX EMISSION LIMIT AND, WHEN APPLICABLE, THE ALTERNATIVE RETROSPECTIVE AND PROSPECTIVE 24-HOUR NOX EMISSION LIMIT (SEE BELOW) SHALL BE DETERMINED AS FOLLOWS:
RULE(S):69.

14.CON'T FROM ABOVE

$$EL = [(0.15)(QG)(HHVG) + (0.40)(QO)(HHVO)]/[(QG)(HHVG) + (QO)(HHVO)]$$

WHERE: EL = NOX EMISSION LIMIT, IN POUNDS PER GROSS MEGAWATT-HOUR;
QG = NATURAL GAS FLOW RATE, 100 STANDARD CUBIC FEET PER HOUR;
HHVG = NATURAL GAS HIGHER HEATING VALUE, IN BTU PER 100 STANDARD CUBIC FEET;
QO = LIQUID FUEL FLOW RATE, IN POUNDS PER HOUR; AND
HHVO = LIQUID FUEL HIGHER HEATING VALUE, IN BTU PER POUND;

AND WHERE QG, HHVG, HHVO, AND QO ARE AVERAGED OVER A CALENDAR DAY FOR DETERMINING COMPLIANCE BASED ON A CALENDAR DAY AVERAGE FOR THE RULE 69 LIMIT AND OVER THE APPLICABLE 24- AND SHUTDOWNS.OR PROSPECTIVE 24-HOUR AVERAGE FOR STARTUPS
RULE(S):69.

15.CON'T FROM ABOVE

PERMIT TO OPERATE

FOR CALENDAR DAYS IN WHICH A STARTUP(S) OR SHUTDOWN(S) OCCURS, THE MASS EMISSION RATE OF NOX PER UNIT OF GROSS ELECTRICAL ENERGY GENERATED FROM THIS EQUIPMENT WHEN FIRED ON EITHER NATURAL GAS, LIQUID FUEL, OR A COMBINATION OF BOTH SHALL NOT EXCEED ONE OF THE FOLLOWING THREE ALTERNATIVE LIMITS:

A. THE RULE 69 NOX EMISSION LIMIT FOR THE CALENDAR DAY, AS DETERMINED ABOVE; OR
RULE(S):69.

16.CON'T FROM ABOVE
B. BEGINNING WITH THE LAST NONEXCLUDED (FOR PERIODS EXCLUDED FROM EMISSION LIMIT AND EMISSION RATE AVERAGES SEE D. AND E. OF THIS CONDITION) 10-CLOCK-SECOND PERIOD IN THE CALENDAR DAY, A NOX EMISSION LIMIT, AS DETERMINED ABOVE, BASED ON THE AVERAGE OF THE PRECEDING 24 HOURS THAT HAVE AT LEAST ONE NONEXCLUDED 10-CLOCK-SECOND PERIOD (RETROSPECTIVE 24-HOUR AVERAGE); OR

C. BEGINNING WITH THE FIRST NONEXCLUDED 10-CLOCK-SECOND PERIOD IN THE CALENDAR DAY, A NOX EMISSION LIMIT, AS DETERMINED ABOVE, BASED ON THE AVERAGE OF THE SUCCEEDING 24 HOURS THAT HAVE AT LEAST ONE NONEXCLUDED 10-CLOCK-SECOND PERIOD (PROSPECTIVE 24-HOUR AVERAGE).
RULE(S):69.

17.CON'T FROM ABOVE
FOR EACH CALENDAR DAY IN WHICH A STARTUP(S) OR SHUTDOWN(S) OCCURS, THE PERMITTEE MAY ELECT TO BASE COMPLIANCE ON ANY ONE OF THESE THREE ALTERNATIVES. FOR PURPOSES OF THIS PERMIT, A STARTUP OR SHUTDOWN DURING A CALENDAR DAY OCCURS IF NO FUEL IS COMBUSTED FOR A PERIOD OF AT LEAST 60 CONSECUTIVE CLOCK MINUTES DURING THE CALENDAR DAY.

THE CALENDAR-DAY AND RETROSPECTIVE AND PROSPECTIVE 24-HOUR AVERAGE MASS EMISSION RATE OF NOX PER UNIT OF GROSS ELECTRICAL ENERGY GENERATED SHALL BE AVERAGED OVER THE SAME TIME PERIOD AS THE APPLICABLE NOX EMISSION LIMIT, BASED ON CEMS AND OTHER CONTINUOUS MONITORING DATA, AND CALCULATED IN ACCORDANCE WITH THE MOST RECENT NOX MONITORING PROTOCOL APPROVED IN WRITING BY THE DISTRICT.
RULE(S):69.

18.CON'T FROM ABOVE
THE FOLLOWING TIME PERIODS SHALL BE EXCLUDED FROM THE CALENDAR DAY AND RETROSPECTIVE AND PROSPECTIVE 24-HOUR AVERAGES OF NOX

PERMIT TO OPERATE

EMISSION LIMITS AND EMISSION RATES:

D. NOTWITHSTANDING THE NOX MONITORING PROTOCOL, ANY PORTION OF A CLOCK HOUR, INCLUDING AN ENTIRE CLOCK HOUR, IF APPLICABLE, WHEN THERE IS NO ELECTRICAL GENERATION BY THE STEAM TURBINE GENERATOR OR NO FUEL IS BEING COMBUSTED; AND

E. ANY OTHER PERIODS, IF ANY, THAT ARE SPECIFIED AS EXCLUDED IN THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT AS APPROVED IN WRITING BY THE DISTRICT.
RULE(S):69.

19. THE PERMITTEE SHALL MAINTAIN CALENDAR DAY RECORDS THAT RECORD THE TIME TO THE NEAREST CLOCK MINUTE THAT ELECTRICAL GENERATION COMMENCED AND ELECTRICAL GENERATION ENDED. FOR PURPOSES OF ALL CONDITIONS IN THIS PERMIT, ELECTRICAL GENERATION COMMENCES WHEN GROSS ELECTRICAL POWER OUTPUT FROM THE STEAM TURBINE GENERATOR EQUALS OR EXCEEDS 2.0 MEGAWATT (MW) AND ENDS WHEN GROSS ELECTRICAL POWER OUTPUT FROM THE STEAM TURBINE GENERATOR IS LESS THAN 2.0 MW.
RULE(S):21, 69.

20. SCR OPERATION CONDITION. AT ALL TIMES WHEN FUEL IS BEING COMBUSTED, ALL COMBUSTION EMISSIONS FROM THE BOILER SHALL BE VENTED TO THE SCR SYSTEM. THE SCR SHALL BE IN FULL OPERATION WHEN THE SCR SYSTEM INLET TEMPERATURE EQUALS OR EXCEEDS 500 DEGREES F WHEN FIRING NATURAL GAS OR 570 DEGREES F WHEN FIRING LIQUID FUEL EXCEPT FOR PERIODS OF REPAIR OR MAINTENANCE TO THE SCR SYSTEM OR RECOVERY OF NORMAL BOILER OPERATIONS FOLLOWING AN INADVERTENT FLAMEOUT. FOR THE ENTIRE DURATION OF SUCH REPAIR , MAINTENANCE, OR INADVERTENT FLAMEOUT PERIODS, ALL OF THE FOLLOWING MUST BE SATISFIED: (1) THE CEMS SHALL BE IN CONTINUOUS OPERATION; (2) NO PERIODS EXCLUDED FROM CALCULATION OF THE NOX MASS EMISSION LIMIT OR EMISSION RATE AS SPECIFIED IN THE "NOX EMISSION LIMIT CONDITION" OR THE APPROVED NOX MONITORING PROTOCOL SHALL OCCUR EXCEPT A PERIOD DURING WHICH THE CEMS PROBE IS BEING PURGED NOT TO EXCEED FIVE CLOCK MINUTES IN ANY CLOCK HOUR;
RULE(S):69.

21.CON'T FROM ABOVE
AND (3) FOR EACH CALENDAR DAY ON WHICH THE SCR SYSTEM REPAIR OR MAINTENANCE IS PERFORMED OR RECOVERY OF NORMAL OPERATIONS FOLLOWING AN INADVERTENT FLAMEOUT OCCURS, THE "NOX EMISSION LIMIT CONDITION" IS COMPLIED WITH. THE PERMITTEE SHALL MAINTAIN A LOG INDICATING THE DATE AND TIME PERIODS OF ALL SUCH SCR

PERMIT TO OPERATE

SYSTEM MAINTENANCE OR REPAIR AND THE NATURE OF THE MAINTENANCE OR REPAIR PERFORMED.
RULE(S):69.

22. THE PERMITTEE SHALL PROVIDE, AS PART OF THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT, A DESCRIPTION OF ALL EXTERNAL SURFACE AREAS OF ALL EQUIPMENT OF THE SCR AND WHERE A POSITIVE PRESSURE DIFFERENTIAL EXISTS BETWEEN THE PRODUCTS OF COMBUSTION AND THE AMBIENT ATMOSPHERE, ALL SUCH AREAS OPERATING AT LESS THAN ATMOSPHERIC PRESSURE, AND ALL SUCH AREAS CONTROLLED WITH A SEALING AIR SYSTEM.
RULE(S):69.

23. THIS EQUIPMENT SHALL BE EQUIPPED WITH CONTINUOUS MONITORS, AND ASSOCIATED DATA COLLECTION, PROCESSING AND STORAGE SYSTEMS, WHICH RECORD AND PRESERVE ALL INFORMATION NECESSARY TO DEMONSTRATE COMPLIANCE WITH DISTRICT RULE 69. THESE CONTINUOUS MONITORS, INCLUDING ANY IDENTIFIED ALTERNATIVE MONITORS USED WHEN A PRIMARY MONITOR IS UNAVAILABLE, AND ASSOCIATED DATA COLLECTION, PROCESSING AND STORAGE SYSTEMS SHALL, AS APPLICABLE, BE INSTALLED, CERTIFIED, CALIBRATED, AND OPERATED; PROCESS MONITORING DATA; AND PERFORM CALCULATIONS IN ACCORDANCE WITH THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT, "RULE 69 NOX COMPLIANCE PROTOCOL FOR SOUTH BAY POWER STATION UNIT 1," AS APPROVED IN WRITING BY THE DISTRICT. (THE PERMITTEE MAY APPLY TO REVISE ANY SUCH NOX PROTOCOL AND, UPON WRITTEN APPROVAL BY THE DISTRICT, THE REVISED PROTOCOL SHALL REPLACE THE PREVIOUS PROTOCOL.
RULE(S):69.

24.CON'T FROM ABOVE
IN ADDITION, THE DISTRICT MAY REVISE
THE NOX PROTOCOL TO ENSURE COMPLIANCE WITH ANY APPLICABLE REQUIREMENTS OF RULE 69.) THE CALCULATION METHODOLOGY OF THE NOX MONITORING PROTOCOL SHALL SPECIFY THE TIME OF COMPLETION AND RECORDING OF ALL CALCULATIONS. THE MONITORS SHALL BE IN FULL OPERATION AT ALL TIMES WHEN THE EQUIPMENT IS IN OPERATION EXCEPT FOR PERIODS, IF ANY, EXCLUDED IN THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT AS APPROVED IN WRITING BY THE DISTRICT. FOR EACH CALENDAR DAY AND CLOCK HOUR WHEN FUEL IS COMBUSTED, AT A MINIMUM, THE PERMITTEE SHALL PERFORM THE FOLLOWING AND, NO LATER THAN APRIL 1, 2004, OR THE EFFECTIVE IMPLEMENTATION DATE OF THE NOX MONITORING PROTOCOL, PERFORM THE FOLLOWING IN ACCORDANCE WITH THE MOST RECENT APPROVED NOX MONITORING PROTOCOL:
RULE(S):69.

25.CON'T FROM ABOVE

PERMIT TO OPERATE

A. FOR EVERY 10-SECOND PERIOD, AT A MINIMUM, MEASURE AND SUM THE VALUES FOR GROSS ELECTRICAL POWER OUTPUT, NATURAL GAS FLOW RATE, LIQUID FUEL FLOW RATE, AMMONIA SOLUTION FLOW RATE, SCR OUTLET NOX CONCENTRATION UNCORRECTED FOR O2 CONCENTRATION, SCR OUTLET O2 PERCENTAGE, AND THE SCR INLET TEMPERATURE AND CALCULATE AND SUM THE FUEL HEAT INPUT RATES, SCR OUTLET NOX CONCENTRATION CORRECTED TO 3% O2, AND NOX MASS EMISSION RATE;
RULE(S):69.

26.CON'T FROM ABOVE
FOR EACH CLOCK HOUR, CALCULATE AND RECORD THE AVERAGE VALUES FOR THE GROSS ELECTRICAL POWER OUTPUT, NATURAL GAS FLOW RATE, LIQUID FUEL FLOW RATE, FUEL HEAT INPUT RATES, AMMONIA SOLUTION FLOW RATE, SCR OUTLET NOX CONCENTRATION UNCORRECTED FOR O2 PERCENTAGE, SCR OUTLET NOX CONCENTRATION CORRECTED TO 3% O2, THE SCR OUTLET O2 CONCENTRATION, THE SCR INLET TEMPERATURE, THE NOX EMISSION RATE EXPRESSED IN POUNDS PER HOUR AND THE PORTION OF TIME DURING THE CLOCK HOUR THAT THE EQUIPMENT WAS OPERATIONAL;
RULE(S):69.

27.CON'T FROM ABOVE
C. FOR EACH CALENDAR DAY IN WHICH A STARTUP OR SHUTDOWN OCCURS AND THE PERMITTEE ELECTS TO BASE COMPLIANCE ON A RETROSPECTIVE 24-HOUR AVERAGE, CALCULATE AND RECORD WITHIN 30 CALENDAR DAYS OF THE END OF THAT CALENDAR DAY THE RETROSPECTIVE 24-HOUR NOX EMISSION LIMIT, TOTAL NOX EMITTED FOR THE RETROSPECTIVE 24-HOUR PERIODEXPRESSED IN POUNDS, TOTAL GROSS ELECTRICAL ENERGY GENERATION OUTPUT FOR THE RETROSPECTIVE 24-HOUR PERIOD EXPRESSED IN MEGAWATT-HOURS, AND THE RETROSPECTIVE 24-HOUR AVERAGE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR;
RULE(S):69.

28.CON'T FROM ABOVE
D. FOR EACH CALENDAR DAY IN WHICH A STARTUP OR SHUTDOWN OCCURS AND THE PERMITTEE ELECTS TO BASE COMPLIANCE ON A PROSPECTIVE 24-HOUR AVERAGE, CALCULATE AND RECORD WITHIN 30 CALENDAR DAYS OF THE DATE THAT THE APPLICABLE 24-HOUR PERIOD ~~ENDS~~ THE PROSPECTIVE 24-HOUR NOX EMISSION LIMIT, TOTAL NOX EMITTED FOR THE PROSPECTIVE 24-HOUR PERIOD EXPRESSED IN POUNDS, TOTAL GROSS ELECTRICAL ENERGY GENERATION OUTPUT FOR THE PROSPECTIVE 24-HOUR PERIOD EXPRESSED IN MEGAWATT-HOURS, AND THE PROSPECTIVE 24-HOUR AVERAGE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR;

PERMIT TO OPERATE

RULE(S):69.

29.CON'T FROM ABOVE

E. FOR EACH CALENDAR DAY, CALCULATE AND RECORD THE RULE 69 NOX EMISSION LIMIT, THE TOTAL NOX EMITTED EXPRESSED IN POUNDS, THE TOTAL GROSS ELECTRICAL ENERGYGENERATION OUTPUT EXPRESSED IN MEGAWATT-HOURS, AND THE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR DURING OPERATION OF THIS EQUIPMENT; AND

F. FOR EACH CLOCK HOUR OR EACH CALENDAR-DAY, MEASURE, CALCULATE, AND RECORD THE AVERAGE VALUE OF ANY OTHER INFORMATION AS SPECIFIED IN THE RULE 69 NOX COMPLIANCE PROTOCOL FOR THIS EQUIPMENT.
RULE(S):69.

30. THE HIGHER HEATING VALUE OF NATURAL GAS USED IN THIS EQUIPMENT SHALL BE THE VALUE REPORTED BY THE UTILITY SUPPLYING THE NATURAL GAS TO THIS FACILITY DURING THE PREVIOUS CALENDAR MONTH THE HIGHER HEATING VALUE OF LIQUID FUEL USED IN THIS EQUIPMENT SHALL BE MEASURED AND RECORDED WHEN A NEW DELIVERY OF LIQUID FUEL RECEIVED.
RULE(S):69, 40 CFR PART 75.

31. WHEN FIRED ON NATURAL GAS, THE EMISSIONS OF AMMONIA, SHALL NOT EXCEED 12 PARTS PER MILLION BY VOLUME ON A DRY BASIS (PPMVD) CORRECTED TO 3% OXYGEN AND, WHEN FIRED ON LIQUID FUEL, THE EMISSIONS OF AMMONIA SHALL NOT EXCEED 12 PARTS PER MILLION BY VOLUME ON A DRY BASIS (PPMVD) CORRECTED TO 3% OXYGEN.
RULE(S):1200.

32. THE AMMONIA INJECTION FLOW RATE SHALL BE CONTINUOUSLY MONITORED, RECORDED, AND, EXCEPT AS PROVIDED FOR IN THE "SCR OPERATION CONDITION", CONTROLLED. THE PERMITTEE OF THIS EQUIPMENT SHALL RECORD THE DATE, DESCRIPTION, AND RESULTS OF ALL DEVICE QUALITY ASSURANCE TESTS, CALIBRATIONS, AND MAINTENANCE OF THE AMMONIA INJECTION AND MONITORING SYSTEM.
RULE(S):21.

33. ALL RECORDS REQUIRED BY THIS PERMIT SHALL BE KEPT FOR A MINIMUM OF FIVE (5) YEARS, MAINTAINED ON SITE, AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST. WHEN REQUESTED BY THE DISTRICT, RECORDS SHALL BE PROVIDED IN AN ELECTRONIC FORMAT ACCEPTABLE TO THE DISTRICT.
RULE(S):1421.

34. WHEN OPERATING, THIS EQUIPMENT SHALL BE IN COMPLIANCE WITH DISTRICT

PERMIT TO OPERATE

RULE 68. THE PERMITTEE SHALL MAINTAIN RECORDS IN ACCORDANCE WITH RULE 68 TO VERIFY COMPLIANCE.
RULE(S):68.

35. THIS EQUIPMENT SHALL BE SOURCE TESTED AT LEAST ONCE PER PERMIT YEAR BEFORE THE PERMIT TO OPERATE RENEWAL DATE, TO DEMONSTRATE COMPLIANCE WITH THE AMMONIA EMISSION STANDARD OF THIS PERMIT, USING DISTRICT APPROVED METHODS, UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT.
RULE(S):21.

36. WHEN BURNING LIQUID FUEL THE PERMITTEE SHALL SAMPLE THE LIQUID FUEL AS CLOSE AS SAFE AND PRACTICABLE TO THE BURNER TIP IN EACH CALENDAR DAY THAT LIQUID FUEL IS BURNED IF: (1) NO LIQUID FUEL SULFUR CONTENT ANALYSIS OF A SAMPLE TAKEN SUBSEQUENT TO THE COMPLETION OF THE MOST RECENT FUEL DELIVERY IS AVAILABLE FOR ANY TANK SUPPLYING FUEL TO THIS EQUIPMENT, (2) THE SULFUR CONTENT OF ANY TANK SUPPLYING FUEL TO THIS EQUIPMENT IS GREATER THAN 0.5 PERCENT BY WEIGHT BASED ON THE MOST RECENT AVAILABLE ANALYSIS OF A SAMPLE FROM THE TANK,
RULE(S):1421, 62, 40 CFR PART 75.

37.CON'T FROM ABOVE
OR (3) AT THE
ELECTION OF THE PERMITTEE. ALL LIQUID FUEL SHALL BE SAMPLED BY A METHOD IN ACCORDANCE WITH 40 CFR PART 75 OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA. ALL FUEL SAMPLES SHALL BE ANALYZED FOR SULFUR CONTENT NO LATER THAN 30 CALENDAR DAYS OF BEING SAMPLED OR, AT THE REQUEST OF THE DISTRICT OR EPA, ANALYZED FOR SULFUR CONTENT NO LATER THAN FIVE CALENDAR DAYS FROM THE DATE OF THE SAMPLE. THE SULFUR CONTENT OF ANY LIQUID FUEL SHALL BE MEASURED IN ACCORDANCE WITH ASTM D4294-90, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY ENERGY-DISPERSIVE X-RAY FLUORESCENCE SPECTROSCOPY," ASTM D2622-92, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY X-RAY SPECTROMETRY," OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.
RULE(S):40 CFR PART 75, 1421, 62.

38.CON'T FROM ABOVE
THE PERMITTEE SHALL MAINTAIN RECORDS OF THE RESULTS OF EACH DAILY SULFUR ANALYSIS FOR FUEL SUPPLIED TO THE BURNER TIP AND EACH ANALYSIS OF STORAGE TANK FUEL INCLUDING, AT A MINIMUM, THE DATE OF THE SAMPLE; THE DATE OF FUEL DELIVERY TO THE STORAGE TANK, IF APPLICABLE; AND SULFUR ANALYSIS RESULTS, AND THE TEST METHOD USED.
RULE(S):62, 40 CFR PART 75, 1421.

39. THE HIGHER HEATING VALUE OF LIQUID FUEL SHALL BE DETERMINED IN

PERMIT TO OPERATE

ACCORDANCE WITH 40 CFR PART 75 APPENDIX D METHODS FOR DETERMINING LIQUID FUEL GROSS CALORIFIC VALUE (HEAT CONTENT).
RULE(S):TITLE IV, 21.

40. AT THE REQUEST OF THE DISTRICT OR EPA, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH EPA METHOD 5, "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA. A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE REQUESTOR SHALL BE USED FOR THIS PURPOSE.
RULE(S):1421.

41. THE PERMITTEE SHALL HAVE A CONTINUOUS OPACITY MONITORING SYSTEM (COMS) INSTALLED AND MAINTAINED IN ACCORDANCE WITH RULE 19.2 ON THE EXHAUST STACK FOR THE PRODUCTS OF COMBUSTION FROM THIS EQUIPMENT. WHEN BURNING LIQUID FUEL, THE PERMITTEE SHALL OPERATE THIS COMS IN ACCORDANCE WITH RULE 19.2
RULE(S):50, 19.2.

42. PERMITTEE SHALL ACCOMPLISH BOILER LIGHT OFF WITH NATURAL GAS FUEL ONLY, EXCEPT IN THE EVENT OF ACTUAL INTERRUPTION OF THE NATURAL GAS SUPPLY FOR BOILER LIGHT OFF. THE DISTRICT SHALL BE NOTIFIED WHEN A FUEL OTHER THAN NATURAL GAS IS USED FOR BOILER LIGHT OFF.
RULE(S):51.

43. EVERY EFFORT SHALL BE MADE TO SCHEDULE AND CONDUCT SOOT-BLOWING WHEN THE WIND DIRECTION IS NOT TOWARD A FALLOUT SENSITIVE AREA.

B. DISTRICT-ONLY--ENFORCEABLE CONDITIONS

44. AT THE REQUEST OF THE DISTRICT, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH DISTRICT METHOD 5 "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE DISTRICT SHALL BE USED FOR THIS PURPOSE.
RULE(S):53.

45. AT LEAST ONCE EACH CALENDAR DAY IN WHICH THE BOILER IS OPERATED FOR SIX HOURS OR MORE, THE PERMITTEE SHALL CONDUCT A LEAK INSPECTION OF ALL ACCESSIBLE EXTERNAL SURFACE AREAS OF ALL EQUIPMENT-INCLUDING, BUT NOT LIMITED TO, THE FURNACE, BOILER, ECONOMIZER, AND COMBUSTION EXHAUST GAS DUCTING-THAT IS LOCATED BEFORE THE EXIT OF THE SCR AND WHERE A POSITIVE PRESSURE DIFFERENTIAL EXISTS BETWEEN THE PRODUCTS OF COMBUSTION AND THE AMBIENT ATMOSPHERE, IF ANY. FOR INSULATED

PERMIT TO OPERATE

AREAS, THE EXTERNAL SURFACE AREA IS THE EXTERNAL SURFACE OF THE INSULATION. THE LEAK INSPECTION AREAS EXCLUDE AREAS OPERATING AT LESS THAN ATMOSPHERIC PRESSURE AND THOSE AREAS CONTROLLED WITH AN OPERATING SEALING AIR SYSTEM. IN ADDITION, AT LEAST ONCE EVERY TWO CALENDAR YEARS THE PERMITTEE SHALL CONDUCT A SURVEY OF THESE LEAK INSPECTION AREAS WITH INFRARED THERMOGRAPHY OR AN EQUIVALENT METHOD.
RULE(S):21, 69.

46.CON'T FROM CONDITION 27645
FOR EACH LEAK DISCOVERED IN THE LEAK INSPECTION AREA THAT HAS A VISIBLE LEAK AREA GREATER THAN 1.5 SQUARE FEET, THE PERMITTEE SHALL NOTIFY THE DISTRICT COMPLIANCE DIVISION WITHIN 2 HOURS OF THE DISCOVERY AND PROVIDE THE DISTRICT WITH THE APPROXIMATE DIMENSIONS AND LOCATION OF THE LEAK AND PROPOSED TIME FOR REPAIR. AT A MINIMUM, THE PERMITTEE SHALL REPAIR AS SOON AS PRACTICABLE ANY LEAKS DISCOVERED IN THE LEAK INSPECTION AREA LARGER THAN 0.5 SQUARE FEET AND ANY LEAKS NECESSARY TO MAINTAIN COMPLIANCE WITH RULE 69 EMISSION LIMITATIONS. THE PERMITTEE SHALL MAINTAIN A LOG THAT, FOR EACH LEAK REPAIRED, RECORDS: THE DATE OF DISCOVERY; A DESCRIPTION THAT INCLUDES THE LEAK'S MAXIMUM LENGTH AND WIDTH AS DETERMINED DURING THE REPAIR, THE LEAK'S LOCATION, AS DETERMINED DURING REPAIR; THE DATE REPAIR IS COMPLETED; AND THE NATURE OF THE REPAIR.
RULE(S):69, 21.

47.CON'T FROM CONDITION 27646
IN
ADDITION, THE PERMITTEE SHALL MAINTAIN A LOG THAT RECORDS THE DATE OF ANY MALFUNCTIONS, MAINTENANCE, AND REPAIR OF THE SEALING AIR SYSTEM. IN THE ABSENCE OF OTHER INFORMATION, A LEAK'S CROSS SECTIONAL FLOW AREA FOR DETERMINING LEAK RATE SHALL BE THE MAXIMUM LENGTH OF THE LEAK TIMES THE MAXIMUM WIDTH OF THE LEAK. NOTWITHSTANDING THE APPROVED PROTOCOL, EMISSIONS FROM LEAKS OF COMBUSTION PRODUCTS PRIOR TO TREATMENT IN THE SCR MAY BE CONSIDERED BY THE DISTRICT WHEN DETERMINING COMPLIANCE WITH ANY APPLICABLE EMISSION LIMIT.
RULE(S):21, 69.

48. THIS AIR POLLUTION CONTROL DISTRICT PERMIT DOES NOT RELIEVE THE HOLDER FROM OBTAINING PERMITS OR AUTHORIZATIONS REQUIRED BY OTHER GOVERNMENTAL AGENCIES.

49. THE PERMITTEE, SHALL UPON DETERMINATION OF APPLICABILITY AND WRITTEN NOTIFICATION BY THE DISTRICT, COMPLY WITH ALL
APPLICABLE REQUIREMENTS OF THE AIR TOXICS 'HOT SPOTS'

CONTROL NO.
274864

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

PERMIT NO
000794
EXPIRES
MARCH 2007

PERMIT TO OPERATE

INFORMATION AND ASSESSMENT ACT (CALIFORNIA HEALTH AND SAFETY CODE SECTION 44300 ET.SEQ.).

CONTROL NO.
274865

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
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PERMIT TO OPERATE

THE FOLLOWING IS HEREBY GRANTED A PERMIT TO OPERATE THE ARTICLE,MACHINE,EQUIPMENT OR CONTRIVANCE DESCRIBED BELOW. THIS PERMIT IS NOT TRANSFERABLE TO A NEW OWNER NOR IS IT VALID FOR OPERATION OF THE EQUIPMENT AT ANOTHER LOCATION, EXCEPT AS SPECIFIED. THIS PERMIT TO OPERATE OR A COPY MUST BE POSTED ON OR WITHIN 25 FEET OF THE OF THE EQUIPMENT, OR READILY AVAILABLE, ON THE OPERATING PREMISES.

PERMITTEE
LSP SOUTH BAY LLC
JIM NYLANDER
990 BAY BL
CHULA VISTA CA 91911-1651

EQUIPMENT ADDRESS
LSP SOUTH BAY LLC

990 BAY BL
CHULA VISTA CA 91911-0000

EQUIPMENT DESCRIPTION REVISED COPY
UTILITY BOILER, UNIT 2: BABCOCK & WILCOX, 1510 MM BTU/HR INPUT, NATURAL IL GAS-FIRED AND/OR RESIDUAL OIL FIRED, S/N 23002-62; GRASEBY/STI CONTINUOUS EMISSIONS MONITORING (CEM) SYSTEM AND ASSOCIATED SOFTWARE; IN DUCT INJECT-PLATE SELECTIVE CATALYTIC REDUCTION SYSTEM USING AQUEOUS AMMONIA, ASSOCIATED AMMONIA INJECTION SYSTEM AND EVAPORATION SKID, ASSOCIATED AMMONIA INJECTION CONTROL AND MONITORING EQUIPMENT, AND ANCILLARY EQUIPMENT

Sector#:17 ID#:00334A PO#:000795 BEC#:12587
Fee Schedules: 13D01 92G01 92I01

EVERY PERSON WHO OWNS OR OPERATES THIS EQUIPMENT IS REQUIRED TO COMPLY WITH THE CONDITIONS LISTED BELOW AND ALL APPLICABLE REQUIREMENTS AND DISTRICT RULES, INCLUDING BUT NOT LIMITED TO RULE(S) 19.2, 53, 62, 68, 69.

FAILURE TO OPERATE IN COMPLIANCE IS A MISDEMEANOR SUBJECT TO CIVIL AND CRIMINAL PENALTIES.

A. FEDERALLY-ENFORCEABLE AND DISTRICT-ENFORCEABLE CONDITIONS

1. THE PERMITTEE SHALL COMPLY WITH RULE(S) 19.2, 50, 51, 53, 62, AND 68.
   RULE(S):1421.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND OPERATED IN ACCORDANCE WITH GOOD AIR POLLUTION CONTROL PRACTICES AT ALL TIMES.
   RULE(S):21.

3. THE PERMITTEE SHALL MAINTAIN THE STACK GAS PH AT 5.0 OR GREATER WHEN LIQUID FUEL IS BURNED. A 45.0 WT.% TO 55.0 WT.% CALCIUM NITRATE AQUEOUS SOLUTION, OR A 36.5 WT. % TO 46.5 WT. % MAGNESIUM OXIDE SLURRY, SHALL BE USED AS A FUEL ADDITIVE TO ENSURE STACK PH IS 5.0 OR GREATER. COMPLIANCE WITH THE WEIGHT PERCENT CONCENTRATION LIMITS

PERMIT TO OPERATE

MAY BE DEMONSTRATED BY MANUFACTURER'S CERTIFICATION FOR EACH DELIVERY. FUEL ADDITIVES AT HIGHER OR LOWER CONCENTRATION MAY BE USED IF PRIOR WRITTEN APPROVAL IS GRANTED BY THE DISTRICT. A MATERIAL SAFETY DATA SHEET OF EACH ADDITIVE AND EACH MANUFACTURER CERTIFICATION OF THE CONCENTRATION SHALL BE MAINTAINED ON SITE AND A COPY SHALL BE PROVIDED TO THE DISTRICT UPON REQUEST. IF LIQUID FUEL WILL BE BURNED FOR 24 CONSECUTIVE HOURS OR MORE, STACK GAS PH SHALL BE MEASURED IN ACCORDANCE WITH A DISTRICT APPROVED TEST METHOD, WITHIN THAT PERIOD AND ONCE WITHIN EVERY 24-HOUR PERIOD THEREAFTER UNTIL LIQUID FUEL IS NO LONGER BURNED.
RULE(S):51.

4.CON'T FROM ABOVE
IF LIQUID FUEL WILL
BE BURNED FOR LESS THAN 24 CONSECUTIVE HOURS BUT MORE THAN 12 CONSECUTIVE HOURS, STACK GAS PH SHALL BE MEASURED IN ACCORDANCE WITH INSTRUCTION NO. 5.240.0 REV. NO. 0, "RELATIVE ACIDITY MEASUREMENT (STACK GAS TESTING) IN THE "SDG&E OPERATING SYSTEMS ANALYSIS PROCEDURES MANUAL," OR WITH AN ALTERNATIVE DISTRICT-APPROVED TEST METHOD, AS SOON AS PRACTICAL AFTER THE CONCLUSION OF THE BURN BUT NOT LATER THAN 24 HOURS FROM THE BEGINNING OF THE OIL BURN. THE PERMITTEE SHALL MAINTAIN A COPY OF THE APPROVED TEST METHOD ON SITE AND MAKE IT AVAILABLE TO THE DISTRICT UPON REQUEST. THE STACK GAS PH, DATE, TIME, AND TEST METHOD USED FOR THE MEASUREMENT SHALL BE RECORDED FOR EACH MEASUREMENT.
RULE(S):51.

5. LIQUID FUEL SULFUR CONTENT SHALL NOT EXCEED 0.5% SULFUR BY WEIGHT AT THE BURNER TIP.
RULE(S):62.

6. THE PERMITTEE SHALL NOTIFY THE AIR POLLUTION CONTROL DISTRICT OF EACH FORMAL DAMAGE CLAIM THAT CAN BE ASSOCIATED WITH ACID FALLOUT WITHIN TEN (10) DAYS OF EACH SUCH OCCURRENCE.
RULE(S):51.

7. ALL SOURCE TESTS REQUIRED FOR THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT:

A. FOR MEASUREMENTS OF OXIDES OF NITROGEN AND STACK GAS OXYGEN CONTENT THE SOURCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH DISTRICT METHOD 100, "TEST PROCEDURES FOR THE DETERMINATION OF NOX, CO, AND DILUENT GASES BY CONTINUOUS EMISSION MONITORING," DATED MAY 1995,AS APPROVED BY THE EPA,

PERMIT TO OPERATE

AND EPA METHOD 7E, DETERMINATION OF NITROGEN OXIDES EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA, AND THE APPLICABLE PROVISIONS SPECIFIED IN 40 CFR PART 75.
RULE(S):21, 69, 40 CFR PART 75.

8.CON'T FROM ABOVE

B. FOR MEASUREMENTS OF AMMONIA, THE SOURCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH BAY AREA AIR QUALITY MANAGEMENT DISTRICT (BAAQMD) METHOD ST-1B, "AMMONIA, CONTINUOUS SAMPLING," DATED JANUARY 20, 1982, AS APPROVED BY THE EPA OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.

C. SOURCE TESTING SHALL BE PERFORMED AT NO LESS THAN 80% OF THE BOILER RATING OR IN ACCORDANCE WITH THE SOURCE TEST LOAD REQUIREMENTS OF 40 CFR PART 75.
RULE(S):40 CFR PART 75, 21, 69.

9.CON'T FROM ABOVE

MEASUREMENTS OF OXIDES OF NITROGEN, STACK GAS OXYGEN CONTENT, AND AMMONIA SHALL BE MADE CONCURRENTLY.

FOR EACH SOURCE TEST, A SOURCE TEST PROTOCOL SHALL BE SUBMITTED TO THE DISTRICT FOR WRITTEN APPROVAL AT LEAST 30 DAYS PRIOR TO THE DATE OF THE SOURCE TEST AND, WITHIN 30 DAYS AFTER COMPLETION OF THE SOURCE TEST, A FINAL TEST REPORT SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL, UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT.
RULE(S):21, 69, 40 CFR PART 75.

10. EXCEPT FOR CHANGES THAT ARE SPECIFIED IN THE INITIAL APPROVED NOX MONITORING PROTOCOL OR A SUBSEQUENT REVISION TO THAT PROTOCOL THAT IS APPROVED IN ADVANCE, IN WRITING, BY THE DISTRICT, THE DISTRICT SHALL BE NOTIFIED IN WRITING AT LEAST THIRTY (30) DAYS PRIOR TO ANY PLANNED CHANGES MADE IN THE CEMS/DAHS (INCLUDING THE PROGRAMMABLE LOGIC CONTROLLER) SOFTWARE WHICH AFFECTS THE VALUE OF DATA DISPLAYED ON THE CEMS/DAHS MONITORS WITH RESPECT TO THE PARAMETERS MEASURED BY THEIR RESPECTIVE SENSING DEVICES OR ANY PLANNED CHANGES TO THE SOFTWARE THAT CONTROLS THE AMMONIA FLOW TO THE SCR. UNPLANNED OR EMERGENCY CHANGES SHALL BE REPORTED TO THE DISTRICT WITHIN 96 HOURS.
RULE(S):21.

11. THIS EQUIPMENT SHALL ONLY BE FIRED WITH NATURAL GAS EXCEPT THAT LIQUID FUEL MAY BE FIRED WHEN NATURAL GAS IS NOT AVAILABLE DUE TO A FORCE

PERMIT TO OPERATE

MAJEURE NATURAL GAS CURTAILMENT, AS DEFINED BY DISTRICT RULE 69, AND LIQUID FUEL MAY BE FIRED UP TO A TOTAL OF 160 HOURS IN A CALENDAR YEAR FOR OPERATIONAL AND RELIABILITY TESTING AND FOR COMPLIANCE EMISSIONS TESTING REQUIRED BY THE DISTRICT.
RULE(S):CEQA.

12. THE CEMS TO MONITOR NOX AND O2 REQUIRED BY THIS PERMIT SHALL MEET ALL THE APPLICABLE PERFORMANCE, INSTALLATION, CERTIFICATION, AND QUALITY ASSURANCE AND QUALITY CONTROL PROVISIONS SPECIFIED IN 40 CFR PART 75 APPENDICES A AND B AND BE OPERATED IN ACCORDANCE WITH 40 CFR PART 60.13. FUEL FLOW MONITORS REQUIRED BY THIS PERMIT SHALL MEET ALL APPLICABLE PERFORMANCE, INSTALLATION, CERTIFICATION, CALIBRATION, AND QUALITY ASSURANCE AND QUALITY CONTROL PROVISIONS SPECIFIED IN OF 40 CFR PART 75.
RULE(S):TITLE IV, 40 CFR PART 75, 21, 69.

13. NOX EMISSION LIMIT CONDITION. EXCEPT AS PROVIDED BELOW, FOR EACH CALENDAR DAY, THE AVERAGE MASS EMISSION RATE OF NOX PER UNIT OF ELECTRICAL ENERGY GENERATED FROM THIS EQUIPMENT WHEN FIRED ON EITHER NATURAL GAS, LIQUID FUEL, OR A COMBINATION OF BOTH SHALL NOT EXCEED THE RULE 69 NOX EMISSION LIMIT, IN POUNDS PER GROSS MEGAWATT-HOUR AVERAGED, OVER EACH CALENDAR DAY OF OPERATION. THE RULE 69 NOX EMISSION LIMIT AND, WHEN APPLICABLE, THE ALTERNATIVE RETROSPECTIVE AND PROSPECTIVE 24-HOUR NOX EMISSION LIMIT (SEE BELOW) SHALL BE DETERMINED AS FOLLOWS:
RULE(S):69.

14.CON'T FROM ABOVE

$$EL = [(0.15)(QG)(HHVG) + (0.40)(QO)(HHVO)]/[(QG)(HHVG) + (QO)(HHVO)]$$

WHERE: EL = NOX EMISSION LIMIT, IN POUNDS PER GROSS MEGAWATT-HOUR;
QG = NATURAL GAS FLOW RATE, 100 STANDARD CUBIC FEET PER HOUR;
HHVG = NATURAL GAS HIGHER HEATING VALUE, IN BTU PER 100 STANDARD CUBIC FEET;
QO = LIQUID FUEL FLOW RATE, IN POUNDS PER HOUR; AND
HHVO = LIQUID FUEL HIGHER HEATING VALUE, IN BTU PER POUND;

AND WHERE QG, HHVG, HHVO, AND QO ARE AVERAGED OVER A CALENDAR DAY FOR DETERMINING COMPLIANCE BASED ON A CALENDAR DAY AVERAGE FOR THE RULE 69 LIMIT AND OVER THE APPLICABLE 24- AND SHUTDOWNS.OR PROSPECTIVE 24-HOUR AVERAGE FOR STARTUPS
RULE(S):69.

15.CON'T FROM ABOVE

PERMIT TO OPERATE

FOR CALENDAR DAYS IN WHICH A STARTUP(S) OR SHUTDOWN(S) OCCURS, THE MASS EMISSION RATE OF NOX PER UNIT OF GROSS ELECTRICAL ENERGY GENERATED FROM THIS EQUIPMENT WHEN FIRED ON EITHER NATURAL GAS, LIQUID FUEL, OR A COMBINATION OF BOTH SHALL NOT EXCEED ONE OF THE FOLLOWING THREE ALTERNATIVE LIMITS:

A. THE RULE 69 NOX EMISSION LIMIT FOR THE CALENDAR DAY, AS DETERMINED ABOVE; OR
RULE(S):69.

16.CON'T FROM ABOVE
B. BEGINNING WITH THE LAST NONEXCLUDED (FOR PERIODS EXCLUDED FROM EMISSION LIMIT AND EMISSION RATE AVERAGES SEE D. AND E. OF THIS CONDITION) 10-CLOCK-SECOND PERIOD IN THE CALENDAR DAY, A NOX EMISSION LIMIT, AS DETERMINED ABOVE, BASED ON THE AVERAGE OF THE PRECEDING 24 HOURS THAT HAVE AT LEAST ONE NONEXCLUDED 10-CLOCK-SECOND PERIOD (RETROSPECTIVE 24-HOUR AVERAGE); OR

C. BEGINNING WITH THE FIRST NONEXCLUDED 10-CLOCK-SECOND PERIOD IN THE CALENDAR DAY, A NOX EMISSION LIMIT, AS DETERMINED ABOVE, BASED ON THE AVERAGE OF THE SUCCEEDING 24 HOURS THAT HAVE AT LEAST ONE NONEXCLUDED 10-CLOCK-SECOND PERIOD (PROSPECTIVE 24-HOUR AVERAGE).
RULE(S):69.

17.CON'T FROM ABOVE
FOR EACH CALENDAR DAY IN WHICH A STARTUP(S) OR SHUTDOWN(S) OCCURS, THE PERMITTEE MAY ELECT TO BASE COMPLIANCE ON ANY ONE OF THESE THREE ALTERNATIVES. FOR PURPOSES OF THIS PERMIT, A STARTUP OR SHUTDOWN DURING A CALENDAR DAY OCCURS IF NO FUEL IS COMBUSTED FOR A PERIOD OF AT LEAST 60 CONSECUTIVE CLOCK MINUTES DURING THE CALENDAR DAY.

THE CALENDAR-DAY AND RETROSPECTIVE AND PROSPECTIVE 24-HOUR AVERAGE MASS EMISSION RATE OF NOX PER UNIT OF GROSS ELECTRICAL ENERGY GENERATED SHALL BE AVERAGED OVER THE SAME TIME PERIOD AS THE APPLICABLE NOX EMISSION LIMIT, BASED ON CEMS AND OTHER CONTINUOUS MONITORING DATA, AND CALCULATED IN ACCORDANCE WITH THE MOST RECENT NOX MONITORING PROTOCOL APPROVED IN WRITING BY THE DISTRICT.
RULE(S):69.

18.CON'T FROM ABOVE
THE FOLLOWING TIME PERIODS SHALL BE EXCLUDED FROM THE CALENDAR DAY AND RETROSPECTIVE AND PROSPECTIVE 24-HOUR AVERAGES OF NOX

PERMIT TO OPERATE

EMISSION LIMITS AND EMISSION RATES:

D. NOTWITHSTANDING THE NOX MONITORING PROTOCOL, ANY PORTION OF A CLOCK HOUR, INCLUDING AN ENTIRE CLOCK HOUR, IF APPLICABLE, WHEN THERE IS NO ELECTRICAL GENERATION BY THE STEAM TURBINE GENERATOR OR NO FUEL IS BEING COMBUSTED; AND

E. ANY OTHER PERIODS, IF ANY, THAT ARE SPECIFIED AS EXCLUDED IN THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT AS APPROVED IN WRITING BY THE DISTRICT.
RULE(S):69.

19. THE PERMITTEE SHALL MAINTAIN CALENDAR DAY RECORDS THAT RECORD THE TIME TO THE NEAREST CLOCK MINUTE THAT ELECTRICAL GENERATION COMMENCED AND ELECTRICAL GENERATION ENDED. FOR PURPOSES OF ALL CONDITIONS IN THIS PERMIT, ELECTRICAL GENERATION COMMENCES WHEN GROSS ELECTRICAL POWER OUTPUT FROM THE STEAM TURBINE GENERATOR EQUALS OR EXCEEDS 2.0 MEGAWATT (MW) AND ENDS WHEN GROSS ELECTRICAL POWER OUTPUT FROM THE STEAM TURBINE GENERATOR IS LESS THAN 2.0 MW.
RULE(S):21, 69.

20. SCR OPERATION CONDITION. AT ALL TIMES WHEN FUEL IS BEING COMBUSTED, ALL COMBUSTION EMISSIONS FROM THE BOILER SHALL BE VENTED TO THE SCR SYSTEM. THE SCR SHALL BE IN FULL OPERATION WHEN THE SCR SYSTEM INLET TEMPERATURE EQUALS OR EXCEEDS 500 DEGREES F WHEN FIRING NATURAL GAS OR 570 DEGREES F WHEN FIRING LIQUID FUEL EXCEPT FOR PERIODS OF REPAIR OR MAINTENANCE TO THE SCR SYSTEM OR RECOVERY OF NORMAL BOILER OPERATIONS FOLLOWING AN INADVERTENT FLAMEOUT. FOR THE ENTIRE DURATION OF SUCH REPAIR , MAINTENANCE, OR INADVERTENT FLAMEOUT PERIODS, ALL OF THE FOLLOWING MUST BE SATISFIED: (1) THE CEMS SHALL BE IN CONTINUOUS OPERATION; (2) NO PERIODS EXCLUDED FROM CALCULATION OF THE NOX MASS EMISSION LIMIT OR EMISSION RATE AS SPECIFIED IN THE "NOX EMISSION LIMIT CONDITION" OR THE APPROVED NOX MONITORING PROTOCOL SHALL OCCUR EXCEPT A PERIOD DURING WHICH THE CEMS PROBE IS BEING PURGED NOT TO EXCEED FIVE CLOCK MINUTES IN ANY CLOCK HOUR;
RULE(S):69.

21.CON'T FROM ABOVE
AND (3) FOR EACH CALENDAR DAY ON WHICH THE SCR SYSTEM REPAIR OR MAINTENANCE IS PERFORMED OR RECOVERY OF NORMAL OPERATIONS FOLLOWING AN INADVERTENT FLAMEOUT OCCURS, THE "NOX EMISSION LIMIT CONDITION" IS COMPLIED WITH. THE PERMITTEE SHALL MAINTAIN A LOG INDICATING THE DATE AND TIME PERIODS OF ALL SUCH SCR

PERMIT TO OPERATE

SYSTEM MAINTENANCE OR REPAIR AND THE NATURE OF THE MAINTENANCE OR REPAIR PERFORMED.
RULE(S):69.

22. THE PERMITTEE SHALL PROVIDE, AS PART OF THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT, A DESCRIPTION OF ALL EXTERNAL SURFACE AREAS OF ALL EQUIPMENT OF THE SCR AND WHERE A POSITIVE PRESSURE DIFFERENTIAL EXISTS BETWEEN THE PRODUCTS OF COMBUSTION AND THE AMBIENT ATMOSPHERE, ALL SUCH AREAS OPERATING AT LESS THAN ATMOSPHERIC PRESSURE, AND ALL SUCH AREAS CONTROLLED WITH A SEALING AIR SYSTEM.
RULE(S):69.

23. THIS EQUIPMENT SHALL BE EQUIPPED WITH CONTINUOUS MONITORS, AND ASSOCIATED DATA COLLECTION, PROCESSING AND STORAGE SYSTEMS, WHICH RECORD AND PRESERVE ALL INFORMATION NECESSARY TO DEMONSTRATE COMPLIANCE WITH DISTRICT RULE 69. THESE CONTINUOUS MONITORS, INCLUDING ANY IDENTIFIED ALTERNATIVE MONITORS USED WHEN A PRIMARY MONITOR IS UNAVAILABLE, AND ASSOCIATED DATA COLLECTION, PROCESSING AND STORAGE SYSTEMS SHALL, AS APPLICABLE, BE INSTALLED, CERTIFIED, CALIBRATED, AND OPERATED; PROCESS MONITORING DATA; AND PERFORM CALCULATIONS IN ACCORDANCE WITH THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT, "RULE 69 NOX COMPLIANCE PROTOCOL FOR SOUTH BAY POWER STATION UNIT 1," AS APPROVED IN WRITING BY THE DISTRICT. (THE PERMITTEE MAY APPLY TO REVISE ANY SUCH NOX PROTOCOL AND, UPON WRITTEN APPROVAL BY THE DISTRICT, THE REVISED PROTOCOL SHALL REPLACE THE PREVIOUS PROTOCOL.
RULE(S):69.

24.CON'T FROM ABOVE
IN ADDITION, THE DISTRICT MAY REVISE THE NOX PROTOCOL TO ENSURE COMPLIANCE WITH ANY APPLICABLE REQUIREMENTS OF RULE 69.) THE CALCULATION METHODOLOGY OF THE NOX MONITORING PROTOCOL SHALL SPECIFY THE TIME OF COMPLETION AND RECORDING OF ALL CALCULATIONS. THE MONITORS SHALL BE IN FULL OPERATION AT ALL TIMES WHEN THE EQUIPMENT IS IN OPERATION EXCEPT FOR PERIODS, IF ANY, EXCLUDED IN THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT AS APPROVED IN WRITING BY THE DISTRICT. FOR EACH CALENDAR DAY AND CLOCK HOUR WHEN FUEL IS COMBUSTED, AT A MINIMUM, THE PERMITTEE SHALL PERFORM THE FOLLOWING AND, NO LATER THAN APRIL 1, 2004, OR THE EFFECTIVE IMPLEMENTATION DATE OF THE NOX MONITORING PROTOCOL, PERFORM THE FOLLOWING IN ACCORDANCE WITH THE MOST RECENT APPROVED NOX MONITORING PROTOCOL:
RULE(S):69.

25.CON'T FROM ABOVE

PERMIT TO OPERATE

A. FOR EVERY 10-SECOND PERIOD, AT A MINIMUM, MEASURE AND SUM THE VALUES FOR GROSS ELECTRICAL POWER OUTPUT, NATURAL GAS FLOW RATE, LIQUID FUEL FLOW RATE, AMMONIA SOLUTION FLOW RATE, SCR OUTLET NOX CONCENTRATION UNCORRECTED FOR O2 CONCENTRATION, SCR OUTLET O2 PERCENTAGE, AND THE SCR INLET TEMPERATURE AND CALCULATE AND SUM THE FUEL HEAT INPUT RATES, SCR OUTLET NOX CONCENTRATION CORRECTED TO 3% O2, AND NOX MASS EMISSION RATE;
RULE(S):69.

26.CON'T FROM ABOVE
FOR EACH CLOCK HOUR, CALCULATE AND RECORD THE AVERAGE VALUES FOR THE GROSS ELECTRICAL POWER OUTPUT, NATURAL GAS FLOW RATE, LIQUID FUEL FLOW RATE, FUEL HEAT INPUT RATES, AMMONIA SOLUTION FLOW RATE, SCR OUTLET NOX CONCENTRATION UNCORRECTED FOR O2 PERCENTAGE, SCR OUTLET NOX CONCENTRATION CORRECTED TO 3% O2, THE SCR OUTLET O2 CONCENTRATION, THE SCR INLET TEMPERATURE, THE NOX EMISSION RATE EXPRESSED IN POUNDS PER HOUR AND THE PORTION OF TIME DURING THE CLOCK HOUR THAT THE EQUIPMENT WAS OPERATIONAL;
RULE(S):69.

27.CON'T FROM ABOVE
C. FOR EACH CALENDAR DAY IN WHICH A STARTUP OR SHUTDOWN OCCURS AND THE PERMITTEE ELECTS TO BASE COMPLIANCE ON A RETROSPECTIVE 24-HOUR AVERAGE, CALCULATE AND RECORD WITHIN 30 CALENDAR DAYS OF THE END OF THAT CALENDAR DAY THE RETROSPECTIVE 24-HOUR NOX EMISSION LIMIT, TOTAL NOX EMITTED FOR THE RETROSPECTIVE 24-HOUR PERIODEXPRESSED IN POUNDS, TOTAL GROSS ELECTRICAL ENERGY GENERATION OUTPUT FOR THE RETROSPECTIVE 24-HOUR PERIOD EXPRESSED IN MEGAWATT-HOURS, AND THE RETROSPECTIVE 24-HOUR AVERAGE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR;
RULE(S):69.

28.CON'T FROM ABOVE
D. FOR EACH CALENDAR DAY IN WHICH A STARTUP OR SHUTDOWN OCCURS AND THE PERMITTEE ELECTS TO BASE COMPLIANCE ON A PROSPECTIVE 24-HOUR AVERAGE, CALCULATE AND RECORD WITHIN 30 CALENDAR DAYS OF THE DATE THAT THE APPLICABLE 24-HOUR PERIOD ENDS THE PROSPECTIVE 24-HOUR NOX EMISSION LIMIT, TOTAL NOX EMITTED FOR THE PROSPECTIVE 24-HOUR PERIOD EXPRESSED IN POUNDS, TOTAL GROSS ELECTRICAL ENERGY GENERATION OUTPUT FOR THE PROSPECTIVE 24-HOUR PERIOD EXPRESSED IN MEGAWATT-HOURS, AND THE PROSPECTIVE 24-HOUR AVERAGE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR;

PERMIT TO OPERATE

RULE(S):69.

29.CON'T FROM ABOVE

E. FOR EACH CALENDAR DAY, CALCULATE AND RECORD THE RULE 69 NOX EMISSION LIMIT, THE TOTAL NOX EMITTED EXPRESSED IN POUNDS, THE TOTAL GROSS ELECTRICAL ENERGYGENERATION OUTPUT EXPRESSED IN MEGAWATT-HOURS, AND THE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR DURING OPERATION OF THIS EQUIPMENT; AND

F. FOR EACH CLOCK HOUR OR EACH CALENDAR-DAY, MEASURE, CALCULATE, AND RECORD THE AVERAGE VALUE OF ANY OTHER INFORMATION AS SPECIFIED IN THE RULE 69 NOX COMPLIANCE PROTOCOL FOR THIS EQUIPMENT.
RULE(S):69.

30. THE HIGHER HEATING VALUE OF NATURAL GAS USED IN THIS EQUIPMENT SHALL BE THE VALUE REPORTED BY THE UTILITY SUPPLYING THE NATURAL GAS TO THIS FACILITY DURING THE PREVIOUS CALENDAR MONTH THE HIGHER HEATING VALUE OF LIQUID FUEL USED IN THIS EQUIPMENT SHALL BE MEASURED AND RECORDED WHEN A NEW DELIVERY OF LIQUID FUEL RECEIVED.
RULE(S):69, 40 CFR PART 75.

31. WHEN FIRED ON NATURAL GAS, THE EMISSIONS OF AMMONIA, SHALL NOT EXCEED 12 PARTS PER MILLION BY VOLUME ON A DRY BASIS (PPMVD) CORRECTED TO 3% OXYGEN AND, WHEN FIRED ON LIQUID FUEL, THE EMISSIONS OF AMMONIA SHALL NOT EXCEED 12 PARTS PER MILLION BY VOLUME ON A DRY BASIS (PPMVD) CORRECTED TO 3% OXYGEN.
RULE(S):1200.

32. THE AMMONIA INJECTION FLOW RATE SHALL BE CONTINUOUSLY MONITORED, RECORDED, AND, EXCEPT AS PROVIDED FOR IN THE "SCR OPERATION CONDITION", CONTROLLED. THE PERMITTEE OF THIS EQUIPMENT SHALL RECORD THE DATE, DESCRIPTION, AND RESULTS OF ALL DEVICE QUALITY ASSURANCE TESTS, CALIBRATIONS, AND MAINTENANCE OF THE AMMONIA INJECTION AND MONITORING SYSTEM.
RULE(S):21.

33. ALL RECORDS REQUIRED BY THIS PERMIT SHALL BE KEPT FOR A MINIMUM OF FIVE (5) YEARS, MAINTAINED ON SITE, AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST. WHEN REQUESTED BY THE DISTRICT, RECORDS SHALL BE PROVIDED IN AN ELECTRONIC FORMAT ACCEPTABLE TO THE DISTRICT.
RULE(S):1421.

34. WHEN OPERATING, THIS EQUIPMENT SHALL BE IN COMPLIANCE WITH DISTRICT

PERMIT TO OPERATE

RULE 68. THE PERMITTEE SHALL MAINTAIN RECORDS IN ACCORDANCE WITH RULE 68 TO VERIFY COMPLIANCE.
RULE(S):68.

35. THIS EQUIPMENT SHALL BE SOURCE TESTED AT LEAST ONCE PER PERMIT YEAR BEFORE THE PERMIT TO OPERATE RENEWAL DATE, TO DEMONSTRATE COMPLIANCE WITH THE AMMONIA EMISSION STANDARD OF THIS PERMIT, USING DISTRICT APPROVED METHODS, UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT.
RULE(S):21.

36. WHEN BURNING LIQUID FUEL THE PERMITTEE SHALL SAMPLE THE LIQUID FUEL AS CLOSE AS SAFE AND PRACTICABLE TO THE BURNER TIP IN EACH CALENDAR DAY THAT LIQUID FUEL IS BURNED IF: (1) NO LIQUID FUEL SULFUR CONTENT ANALYSIS OF A SAMPLE TAKEN SUBSEQUENT TO THE COMPLETION OF THE MOST RECENT FUEL DELIVERY IS AVAILABLE FOR ANY TANK SUPPLYING FUEL TO THIS EQUIPMENT, (2) THE SULFUR CONTENT OF ANY TANK SUPPLYING FUEL TO THIS EQUIPMENT IS GREATER THAN 0.5 PERCENT BY WEIGHT BASED ON THE MOST RECENT AVAILABLE ANALYSIS OF A SAMPLE FROM THE TANK,
RULE(S):1421, 62, 40 CFR PART 75.

37.CON'T FROM ABOVE
OR (3) AT THE
ELECTION OF THE PERMITTEE. ALL LIQUID FUEL SHALL BE SAMPLED BY A METHOD IN ACCORDANCE WITH 40 CFR PART 75 OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA. ALL FUEL SAMPLES SHALL BE ANALYZED FOR SULFUR CONTENT NO LATER THAN 30 CALENDAR DAYS OF BEING SAMPLED OR, AT THE REQUEST OF THE DISTRICT OR EPA, ANALYZED FOR SULFUR CONTENT NO LATER THAN FIVE CALENDAR DAYS FROM THE DATE OF THE SAMPLE. THE SULFUR CONTENT OF ANY LIQUID FUEL SHALL BE MEASURED IN ACCORDANCE WITH ASTM D4294-90, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY ENERGY-DISPERSIVE X-RAY FLUORESCENCE SPECTROSCOPY," ASTM D2622-92, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY X-RAY SPECTROMETRY," OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.
RULE(S):40 CFR PART 75, 1421, 62.

38.CON'T FROM ABOVE
THE PERMITTEE SHALL MAINTAIN RECORDS OF THE RESULTS OF EACH DAILY SULFUR ANALYSIS FOR FUEL SUPPLIED TO THE BURNER TIP AND EACH ANALYSIS OF STORAGE TANK FUEL INCLUDING, AT A MINIMUM, THE DATE OF THE SAMPLE; THE DATE OF FUEL DELIVERY TO THE STORAGE TANK, IF APPLICABLE; AND SULFUR ANALYSIS RESULTS, AND THE TEST METHOD USED.
RULE(S):62, 40 CFR PART 75, 1421.

39. THE HIGHER HEATING VALUE OF LIQUID FUEL SHALL BE DETERMINED IN

PERMIT TO OPERATE

ACCORDANCE WITH 40 CFR PART 75 APPENDIX D METHODS FOR DETERMINING LIQUID FUEL GROSS CALORIFIC VALUE (HEAT CONTENT).
RULE(S):TITLE IV, 21.

40. AT THE REQUEST OF THE DISTRICT OR EPA, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH EPA METHOD 5, "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA. A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE REQUESTOR SHALL BE USED FOR THIS PURPOSE.
RULE(S):1421.

41. THE PERMITTEE SHALL HAVE A CONTINUOUS OPACITY MONITORING SYSTEM (COMS) INSTALLED AND MAINTAINED IN ACCORDANCE WITH RULE 19.2 ON THE EXHAUST STACK FOR THE PRODUCTS OF COMBUSTION FROM THIS EQUIPMENT. WHEN BURNING LIQUID FUEL, THE PERMITTEE SHALL OPERATE THIS COMS IN ACCORDANCE WITH RULE 19.2
RULE(S):50, 19.2.

42. PERMITTEE SHALL ACCOMPLISH BOILER LIGHT OFF WITH NATURAL GAS FUEL ONLY, EXCEPT IN THE EVENT OF ACTUAL INTERRUPTION OF THE NATURAL GAS SUPPLY FOR BOILER LIGHT OFF. THE DISTRICT SHALL BE NOTIFIED WHEN A FUEL OTHER THAN NATURAL GAS IS USED FOR BOILER LIGHT OFF.
RULE(S):51.

43. EVERY EFFORT SHALL BE MADE TO SCHEDULE AND CONDUCT SOOT-BLOWING WHEN THE WIND DIRECTION IS NOT TOWARD A FALLOUT SENSITIVE AREA.

B. DISTRICT-ONLY--ENFORCEABLE CONDITIONS

44. AT THE REQUEST OF THE DISTRICT, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH DISTRICT METHOD 5 "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE DISTRICT SHALL BE USED FOR THIS PURPOSE.
RULE(S):53.

45. AT LEAST ONCE EACH CALENDAR DAY IN WHICH THE BOILER IS OPERATED FOR SIX HOURS OR MORE, THE PERMITTEE SHALL CONDUCT A LEAK INSPECTION OF ALL ACCESSIBLE EXTERNAL SURFACE AREAS OF ALL EQUIPMENTT GAS DUCTING-THAT IS LOCATED BEFORE THE EXIT OF THE SCR AND
WHERE A POSITIVE PRESSURE DIFFERENTIAL EXISTS BETWEEN THE PRODUCTS OF COMBUSTION AND THE AMBIENT ATMOSPHERE, IF ANY. FOR INSULATED AREAS, THE EXTERNAL SURFACE AREA IS THE EXTERNAL SURFACE OF THE

PERMIT TO OPERATE

INSULATION. THE LEAK INSPECTION AREAS EXCLUDE AREAS OPERATING AT LESS THAN ATMOSPHERIC PRESSURE AND THOSE AREAS CONTROLLED WITH AN OPERATING SEALING AIR SYSTEM. IN ADDITION, AT LEAST ONCE EVERY TWO CALENDAR YEARS THE PERMITTEE SHALL CONDUCT A SURVEY OF THESE LEAK INSPECTION AREAS WITH INFRARED THERMOGRAPHY OR AN EQUIVALENT METHOD.
RULE(S):21, 69.

46.CON'T FROM CONDITION 27660
FOR EACH LEAK DISCOVERED IN THE LEAK INSPECTION AREA THAT HAS A VISIBLE LEAK AREA GREATER THAN 2.0 SQUARE FEET, THE PERMITTEE SHALL NOTIFY THE DISTRICT COMPLIANCE DIVISION WITHIN 2 HOURS OF THE DISCOVERY AND PROVIDE THE DISTRICT WITH THE APPROXIMATE DIMENSIONS AND LOCATION OF THE LEAK AND PROPOSED TIME FOR REPAIR. AT A MINIMUM, THE PERMITTEE SHALL REPAIR AS SOON AS PRACTICABLE ANY LEAKS DISCOVERED IN THE LEAK INSPECTION AREA LARGER THAN 0.2 SQUARE FEET AND ANY LEAKS NECESSARY TO MAINTAIN COMPLIANCE WITH RULE 69 EMISSION LIMITATIONS. THE PERMITTEE SHALL MAINTAIN A LOG THAT, FOR EACH LEAK REPAIRED, RECORDS: THE DATE OF DISCOVERY; A DESCRIPTION THAT INCLUDES THE LEAK'S MAXIMUM LENGTH AND WIDTH AS DETERMINED DURING THE REPAIR, THE LEAK'S LOCATION, AS DETERMINED DURING REPAIR; THE DATE REPAIR IS COMPLETED; AND THE NATURE OF THE REPAIR.
RULE(S):69, 21.

47.CON'T FROM CONDITION 27661
IN
ADDITION, THE PERMITTEE SHALL MAINTAIN A LOG THAT RECORDS THE DATE OF ANY MALFUNCTIONS, MAINTENANCE, AND REPAIR OF THE SEALING AIR SYSTEM. IN THE ABSENCE OF OTHER INFORMATION, A LEAK'S CROSS SECTIONAL FLOW AREA FOR DETERMINING LEAK RATE SHALL BE THE MAXIMUM LENGTH OF THE LEAK TIMES THE MAXIMUM WIDTH OF THE LEAK. NOTWITHSTANDING THE APPROVED PROTOCOL, EMISSIONS FROM LEAKS OF COMBUSTION PRODUCTS PRIOR TO TREATMENT IN THE SCR MAY BE CONSIDERED BY THE DISTRICT WHEN DETERMINING COMPLIANCE WITH ANY APPLICABLE EMISSION LIMIT.
RULE(S):21, 69.

48. THIS AIR POLLUTION CONTROL DISTRICT PERMIT DOES NOT RELIEVE THE HOLDER FROM OBTAINING PERMITS OR AUTHORIZATIONS REQUIRED BY OTHER GOVERNMENTAL AGENCIES.

49. THE PERMITTEE, SHALL UPON DETERMINATION OF APPLICABILITY AND WRITTEN NOTIFICATION BY THE DISTRICT, COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE AIR TOXICS 'HOT SPOTS' INFORMATION AND ASSESSMENT ACT (CALIFORNIA HEALTH AND

CONTROL NO.
274865

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

PERMIT NO
000795
EXPIRES
MARCH 2007

PERMIT TO OPERATE

SAFETY CODE SECTION 44300 ET.SEQ.).

CONTROL NO.
274866

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

PERMIT NO
001201
EXPIRES
MARCH 2007

PERMIT TO OPERATE

THE FOLLOWING IS HEREBY GRANTED A PERMIT TO OPERATE THE ARTICLE,MACHINE,EQUIPMENT OR CONTRIVANCE DESCRIBED BELOW. THIS PERMIT IS NOT TRANSFERABLE TO A NEW OWNER NOR IS IT VALID FOR OPERATION OF THE EQUIPMENT AT ANOTHER LOCATION, EXCEPT AS SPECIFIED. THIS PERMIT TO OPERATE OR A COPY MUST BE POSTED ON OR WITHIN 25 FEET OF THE OF THE EQUIPMENT, OR READILY AVAILABLE, ON THE OPERATING PREMISES.

PERMITTEE		EQUIPMENT ADDRESS	
LSP SOUTH BAY LLC		LSP SOUTH BAY LLC	
JIM NYLANDER			
990 BAY BL		990 BAY BL	
CHULA VISTA CA	91911-1651	CHULA VISTA CA	91911-0000

EQUIPMENT DESCRIPTION REVISED COPY

UTILITY BOILER, UNIT 3: RILEY STOCKER, 2145 MM BTU/HR INPUT, S/N 23003-64, RESIDUAL OIL AND/OR NATURAL GAS-FIRED; GRASEBY/STI CONTINUOUS EMISSIONS MONITORING SYSTEM AND ASSOCIATED SOFTWARE; IN DUCT PLATE SELECTIVE CATALYTIC REDUCTION SYSTEM USING AQUEOUS AMMONIA, ASSOCIATED AMMONIA INJECTION SYSTEM AND EVAPORATION SKID, ASSOCIATED AMMONIA INJECTION CONTROL AND MONITORING EQUIPMENT, AND ANCILLARY EQUIPMENT

Sector#:17 ID#:00334A PO#:001201 BEC#:12585
Fee Schedules: 13D01 92G01 92I01

EVERY PERSON WHO OWNS OR OPERATES THIS EQUIPMENT IS REQUIRED TO COMPLY WITH THE CONDITIONS LISTED BELOW AND ALL APPLICABLE REQUIREMENTS AND DISTRICT RULES, INCLUDING BUT NOT LIMITED TO RULE(S) 19.2, 53, 62, 68, 69.

FAILURE TO OPERATE IN COMPLIANCE IS A MISDEMEANOR SUBJECT TO CIVIL AND CRIMINAL PENALTIES.

A. FEDERALLY-ENFORCEABLE AND DISTRICT-ENFORCEABLE CONDITIONS

1. THE PERMITTEE SHALL COMPLY WITH RULE(S) 19.2, 50, 51, 53, 62, AND 68.
   RULE(S):1421.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND OPERATED IN ACCORDANCE WITH GOOD AIR POLLUTION CONTROL PRACTICES AT ALL TIMES.
   RULE(S):21.

3. THE PERMITTEE SHALL MAINTAIN THE STACK GAS PH AT 5.0 OR GREATER WHEN LIQUID FUEL IS BURNED. A 45.0 WT.% TO 55.0 WT.% CALCIUM NITRATE AQUEOUS SOLUTION, OR A 36.5 WT. % TO 46.5 WT. % MAGNESIUM OXIDE SLURRY, SHALL BE USED AS A FUEL ADDITIVE TO ENSURE STACK PH IS 5.0 OR GREATER. COMPLIANCE WITH THE WEIGHT PERCENT CONCENTRATION LIMITS MAY BE DEMONSTRATED BY MANUFACTURER'S CERTIFICATION FOR EACH

PERMIT TO OPERATE

DELIVERY. FUEL ADDITIVES AT HIGHER OR LOWER CONCENTRATION MAY BE USED IF PRIOR WRITTEN APPROVAL IS GRANTED BY THE DISTRICT. A MATERIAL SAFETY DATA SHEET OF EACH ADDITIVE AND EACH MANUFACTURER CERTIFICATION OF THE CONCENTRATION SHALL BE MAINTAINED ON SITE AND A COPY SHALL BE PROVIDED TO THE DISTRICT UPON REQUEST. IF LIQUID FUEL WILL BE BURNED FOR 24 CONSECUTIVE HOURS OR MORE, STACK GAS PH SHALL BE MEASURED IN ACCORDANCE WITH A DISTRICT APPROVED TEST METHOD, WITHIN THAT PERIOD AND ONCE WITHIN EVERY 24-HOUR PERIOD THEREAFTER UNTIL LIQUID FUEL IS NO LONGER BURNED.
RULE(S):51.

4.CON'T FROM ABOVE
IF LIQUID FUEL WILL
BE BURNED FOR LESS THAN 24 CONSECUTIVE HOURS BUT MORE THAN 12 CONSECUTIVE HOURS, STACK GAS PH SHALL BE MEASURED IN ACCORDANCE WITH INSTRUCTION NO. 5.240.0 REV. NO. 0, "RELATIVE ACIDITY MEASUREMENT (STACK GAS TESTING) IN THE "SDG&E OPERATING SYSTEMS ANALYSIS PROCEDURES MANUAL," OR WITH AN ALTERNATIVE DISTRICT-APPROVED TEST METHOD, AS SOON AS PRACTICAL AFTER THE CONCLUSION OF THE BURN BUT NOT LATER THAN 24 HOURS FROM THE BEGINNING OF THE OIL BURN. THE PERMITTEE SHALL MAINTAIN A COPY OF THE APPROVED TEST METHOD ON SITE AND MAKE IT AVAILABLE TO THE DISTRICT UPON REQUEST. THE STACK GAS PH, DATE, TIME, AND TEST METHOD USED FOR THE MEASUREMENT SHALL BE RECORDED FOR EACH MEASUREMENT.
RULE(S):51.

5. LIQUID FUEL SULFUR CONTENT SHALL NOT EXCEED 0.5% SULFUR BY WEIGHT AT THE BURNER TIP.
RULE(S):62.

6. THE PERMITTEE SHALL NOTIFY THE AIR POLLUTION CONTROL DISTRICT OF EACH FORMAL DAMAGE CLAIM THAT CAN BE ASSOCIATED WITH ACID FALLOUT WITHIN TEN (10) DAYS OF EACH SUCH OCCURRENCE.
RULE(S):51.

7. ALL SOURCE TESTS REQUIRED FOR THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT:

A. FOR MEASUREMENTS OF OXIDES OF NITROGEN AND STACK GAS OXYGEN CONTENT THE SOURCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH DISTRICT METHOD 100, "TEST PROCEDURES FOR THE DETERMINATION OF NOX, CO, AND DILUENT GASES BY CONTINUOUS EMISSION MONITORING," DATED MAY 1995,AS APPROVED BY THE EPA, AND EPA METHOD 7E, DETERMINATION OF NITROGEN OXIDES EMISSIONS

PERMIT TO OPERATE

FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA, AND THE APPLICABLE PROVISIONS SPECIFIED IN 40 CFR PART 75.
RULE(S):21, 69, 40 CFR PART 75.

8.CON'T FROM ABOVE

B. FOR MEASUREMENTS OF AMMONIA, THE SOURCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH BAY AREA AIR QUALITY MANAGEMENT DISTRICT (BAAQMD) METHOD ST-1B, "AMMONIA, CONTINUOUS SAMPLING," DATED JANUARY 20, 1982, AS APPROVED BY THE EPA OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.

C. SOURCE TESTING SHALL BE PERFORMED AT NO LESS THAN 80% OF THE BOILER RATING OR IN ACCORDANCE WITH THE SOURCE TEST LOAD REQUIREMENTS OF 40 CFR PART 75.
RULE(S):40 CFR PART 75, 21, 69.

9.CON'T FROM ABOVE

MEASUREMENTS OF OXIDES OF NITROGEN, STACK GAS OXYGEN CONTENT, AND AMMONIA SHALL BE MADE CONCURRENTLY.

FOR EACH SOURCE TEST, A SOURCE TEST PROTOCOL SHALL BE SUBMITTED TO THE DISTRICT FOR WRITTEN APPROVAL AT LEAST 30 DAYS PRIOR TO THE DATE OF THE SOURCE TEST AND, WITHIN 30 DAYS AFTER COMPLETION OF THE SOURCE TEST, A FINAL TEST REPORT SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL, UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT.
RULE(S):21, 69, 40 CFR PART 75.

10. EXCEPT FOR CHANGES THAT ARE SPECIFIED IN THE INITIAL APPROVED NOX MONITORING PROTOCOL OR A SUBSEQUENT REVISION TO THAT PROTOCOL THAT IS APPROVED IN ADVANCE, IN WRITING, BY THE DISTRICT, THE DISTRICT SHALL BE NOTIFIED IN WRITING AT LEAST THIRTY (30) DAYS PRIOR TO ANY PLANNED CHANGES MADE IN THE CEMS/DAHS (INCLUDING THE PROGRAMMABLE LOGIC CONTROLLER) SOFTWARE WHICH AFFECTS THE VALUE OF DATA DISPLAYED ON THE CEMS/DAHS MONITORS WITH RESPECT TO THE PARAMETERS MEASURED BY THEIR RESPECTIVE SENSING DEVICES OR ANY PLANNED CHANGES TO THE SOFTWARE THAT CONTROLS THE AMMONIA FLOW TO THE SCR. UNPLANNED OR EMERGENCY CHANGES SHALL BE REPORTED TO THE DISTRICT WITHIN 96 HOURS.
RULE(S):21.

11. THIS EQUIPMENT SHALL ONLY BE FIRED WITH NATURAL GAS EXCEPT THAT LIQUID FUEL MAY BE FIRED WHEN NATURAL GAS IS NOT AVAILABLE DUE TO A FORCE MAJEURE NATURAL GAS CURTAILMENT, AS DEFINED BY DISTRICT RULE 69, AND

PERMIT TO OPERATE

LIQUID FUEL MAY BE FIRED UP TO A TOTAL OF 160 HOURS IN A CALENDAR YEAR FOR OPERATIONAL AND RELIABILITY TESTING AND FOR COMPLIANCE EMISSIONS TESTING REQUIRED BY THE DISTRICT.
RULE(S):CEQA.

12. THE CEMS TO MONITOR NOX AND O2 REQUIRED BY THIS PERMIT SHALL MEET ALL THE APPLICABLE PERFORMANCE, INSTALLATION, CERTIFICATION, AND QUALITY ASSURANCE AND QUALITY CONTROL PROVISIONS SPECIFIED IN 40 CFR PART 75 APPENDICES A AND B AND BE OPERATED IN ACCORDANCE WITH 40 CFR PART 60.13. FUEL FLOW MONITORS REQUIRED BY THIS PERMIT SHALL MEET ALL APPLICABLE PERFORMANCE, INSTALLATION, CERTIFICATION, CALIBRATION, AND QUALITY ASSURANCE AND QUALITY CONTROL PROVISIONS SPECIFIED IN OF 40 CFR PART 75.
RULE(S):TITLE IV, 40 CFR PART 75, 21, 69.

13. NOX EMISSION LIMIT CONDITION. EXCEPT AS PROVIDED BELOW, FOR EACH CALENDAR DAY, THE AVERAGE MASS EMISSION RATE OF NOX PER UNIT OF ELECTRICAL ENERGY GENERATED FROM THIS EQUIPMENT WHEN FIRED ON EITHER NATURAL GAS, LIQUID FUEL, OR A COMBINATION OF BOTH SHALL NOT EXCEED THE RULE 69 NOX EMISSION LIMIT, IN POUNDS PER GROSS MEGAWATT-HOUR AVERAGED, OVER EACH CALENDAR DAY OF OPERATION. THE RULE 69 NOX EMISSION LIMIT AND, WHEN APPLICABLE, THE ALTERNATIVE RETROSPECTIVE AND PROSPECTIVE 24-HOUR NOX EMISSION LIMIT (SEE BELOW) SHALL BE DETERMINED AS FOLLOWS:
RULE(S):69.

14.CON'T FROM ABOVE

$$EL = [(0.15)(QG)(HHVG) + (0.40)(QO)(HHVO)]/[(QG)(HHVG) + (QO)(HHVO)]$$

WHERE: EL = NOX EMISSION LIMIT, IN POUNDS PER GROSS MEGAWATT-HOUR;
QG = NATURAL GAS FLOW RATE, 100 STANDARD CUBIC FEET PER HOUR;
HHVG = NATURAL GAS HIGHER HEATING VALUE, IN BTU PER 100 STANDARD CUBIC FEET;
QO = LIQUID FUEL FLOW RATE, IN POUNDS PER HOUR; AND
HHVO = LIQUID FUEL HIGHER HEATING VALUE, IN BTU PER POUND;

AND WHERE QG, HHVG, HHVO, AND QO ARE AVERAGED OVER A CALENDAR DAY FOR DETERMINING COMPLIANCE BASED ON A CALENDAR DAY AVERAGE FOR THE RULE 69 LIMIT AND OVER THE APPLICABLE 24- AND SHUTDOWNS.OR PROSPECTIVE 24-HOUR AVERAGE FOR STARTUPS
RULE(S):69.

15.CON'T FROM ABOVE
FOR CALENDAR DAYS IN WHICH A STARTUP(S) OR SHUTDOWN(S) OCCURS, THE

PERMIT TO OPERATE

MASS EMISSION RATE OF NOX PER UNIT OF GROSS ELECTRICAL ENERGY GENERATED FROM THIS EQUIPMENT WHEN FIRED ON EITHER NATURAL GAS, LIQUID FUEL, OR A COMBINATION OF BOTH SHALL NOT EXCEED ONE OF THE FOLLOWING THREE ALTERNATIVE LIMITS:

A. THE RULE 69 NOX EMISSION LIMIT FOR THE CALENDAR DAY, AS DETERMINED ABOVE; OR
RULE(S):69.

16.CON'T FROM ABOVE
B. BEGINNING WITH THE LAST NONEXCLUDED (FOR PERIODS EXCLUDED FROM EMISSION LIMIT AND EMISSION RATE AVERAGES SEE D. AND E. OF THIS CONDITION) 10-CLOCK-SECOND PERIOD IN THE CALENDAR DAY, A NOX EMISSION LIMIT, AS DETERMINED ABOVE, BASED ON THE AVERAGE OF THE PRECEDING 24 HOURS THAT HAVE AT LEAST ONE NONEXCLUDED 10-CLOCK-SECOND PERIOD (RETROSPECTIVE 24-HOUR AVERAGE); OR

C. BEGINNING WITH THE FIRST NONEXCLUDED 10-CLOCK-SECOND PERIOD IN THE CALENDAR DAY, A NOX EMISSION LIMIT, AS DETERMINED ABOVE, BASED ON THE AVERAGE OF THE SUCCEEDING 24 HOURS THAT HAVE AT LEAST ONE NONEXCLUDED 10-CLOCK-SECOND PERIOD (PROSPECTIVE 24-HOUR AVERAGE).
RULE(S):69.

17.CON'T FROM ABOVE
FOR EACH CALENDAR DAY IN WHICH A STARTUP(S) OR SHUTDOWN(S) OCCURS, THE PERMITTEE MAY ELECT TO BASE COMPLIANCE ON ANY ONE OF THESE THREE ALTERNATIVES. FOR PURPOSES OF THIS PERMIT, A STARTUP OR SHUTDOWN DURING A CALENDAR DAY OCCURS IF NO FUEL IS COMBUSTED FOR A PERIOD OF AT LEAST 60 CONSECUTIVE CLOCK MINUTES DURING THE CALENDAR DAY.

THE CALENDAR-DAY AND RETROSPECTIVE AND PROSPECTIVE 24-HOUR AVERAGE MASS EMISSION RATE OF NOX PER UNIT OF GROSS ELECTRICAL ENERGY GENERATED SHALL BE AVERAGED OVER THE SAME TIME PERIOD AS THE APPLICABLE NOX EMISSION LIMIT, BASED ON CEMS AND OTHER CONTINUOUS MONITORING DATA, AND CALCULATED IN ACCORDANCE WITH THE MOST RECENT NOX MONITORING PROTOCOL APPROVED IN WRITING BY THE DISTRICT.
RULE(S):69.

18.CON'T FROM ABOVE
THE FOLLOWING TIME PERIODS SHALL BE EXCLUDED FROM THE CALENDAR DAY AND RETROSPECTIVE AND PROSPECTIVE 24-HOUR AVERAGES OF NOX EMISSION LIMITS AND EMISSION RATES:

PERMIT TO OPERATE

D. NOTWITHSTANDING THE NOX MONITORING PROTOCOL, ANY PORTION OF A CLOCK HOUR, INCLUDING AN ENTIRE CLOCK HOUR, IF APPLICABLE, WHEN THERE IS NO ELECTRICAL GENERATION BY THE STEAM TURBINE GENERATOR OR NO FUEL IS BEING COMBUSTED; AND

E. ANY OTHER PERIODS, IF ANY, THAT ARE SPECIFIED AS EXCLUDED IN THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT AS APPROVED IN WRITING BY THE DISTRICT.
RULE(S):69.

19. THE PERMITTEE SHALL MAINTAIN CALENDAR DAY RECORDS THAT RECORD THE TIME TO THE NEAREST CLOCK MINUTE THAT ELECTRICAL GENERATION COMMENCED AND ELECTRICAL GENERATION ENDED. FOR PURPOSES OF ALL CONDITIONS IN THIS PERMIT, ELECTRICAL GENERATION COMMENCES WHEN GROSS ELECTRICAL POWER OUTPUT FROM THE STEAM TURBINE GENERATOR EQUALS OR EXCEEDS 2.0 MEGAWATT (MW) AND ENDS WHEN GROSS ELECTRICAL POWER OUTPUT FROM THE STEAM TURBINE GENERATOR IS LESS THAN 2.0 MW.
RULE(S):21, 69.

20. SCR OPERATION CONDITION. AT ALL TIMES WHEN FUEL IS BEING COMBUSTED, ALL COMBUSTION EMISSIONS FROM THE BOILER SHALL BE VENTED TO THE SCR SYSTEM. THE SCR SHALL BE IN FULL OPERATION WHEN THE SCR SYSTEM INLET TEMPERATURE EQUALS OR EXCEEDS 500 DEGREES F WHEN FIRING NATURAL GAS OR 570 DEGREES F WHEN FIRING LIQUID FUEL EXCEPT FOR PERIODS OF REPAIR OR MAINTENANCE TO THE SCR SYSTEM OR RECOVERY OF NORMAL BOILER OPERATIONS FOLLOWING AN INADVERTENT FLAMEOUT. FOR THE ENTIRE DURATION OF SUCH REPAIR , MAINTENANCE, OR INADVERTENT FLAMEOUT PERIODS, ALL OF THE FOLLOWING MUST BE SATISFIED: (1) THE CEMS SHALL BE IN CONTINUOUS OPERATION; (2) NO PERIODS EXCLUDED FROM CALCULATION OF THE NOX MASS EMISSION LIMIT OR EMISSION RATE AS SPECIFIED IN THE "NOX EMISSION LIMIT CONDITION" OR THE APPROVED NOX MONITORING PROTOCOL SHALL OCCUR EXCEPT A PERIOD DURING WHICH THE CEMS PROBE IS BEING PURGED NOT TO EXCEED FIVE CLOCK MINUTES IN ANY CLOCK HOUR;
RULE(S):69.

21.CON'T FROM ABOVE
AND (3) FOR EACH CALENDAR DAY ON WHICH THE SCR SYSTEM REPAIR OR MAINTENANCE IS PERFORMED OR RECOVERY OF NORMAL OPERATIONS FOLLOWING AN INADVERTENT FLAMEOUT OCCURS, THE "NOX EMISSION LIMIT CONDITION" IS COMPLIED WITH. THE PERMITTEE SHALL MAINTAIN A LOG INDICATING THE DATE AND TIME PERIODS OF ALL SUCH SCR SYSTEM MAINTENANCE OR REPAIR AND THE NATURE OF THE MAINTENANCE OR

PERMIT TO OPERATE

REPAIR PERFORMED.
RULE(S):69.

22. THE PERMITTEE SHALL PROVIDE, AS PART OF THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT, A DESCRIPTION OF ALL EXTERNAL SURFACE AREAS OF ALL EQUIPMENT OF THE SCR AND WHERE A POSITIVE PRESSURE DIFFERENTIAL EXISTS BETWEEN THE PRODUCTS OF COMBUSTION AND THE AMBIENT ATMOSPHERE, ALL SUCH AREAS OPERATING AT LESS THAN ATMOSPHERIC PRESSURE, AND ALL SUCH AREAS CONTROLLED WITH A SEALING AIR SYSTEM.
RULE(S):69.

23. THIS EQUIPMENT SHALL BE EQUIPPED WITH CONTINUOUS MONITORS, AND ASSOCIATED DATA COLLECTION, PROCESSING AND STORAGE SYSTEMS, WHICH RECORD AND PRESERVE ALL INFORMATION NECESSARY TO DEMONSTRATE COMPLIANCE WITH DISTRICT RULE 69. THESE CONTINUOUS MONITORS, INCLUDING ANY IDENTIFIED ALTERNATIVE MONITORS USED WHEN A PRIMARY MONITOR IS UNAVAILABLE, AND ASSOCIATED DATA COLLECTION, PROCESSING AND STORAGE SYSTEMS SHALL, AS APPLICABLE, BE INSTALLED, CERTIFIED, CALIBRATED, AND OPERATED; PROCESS MONITORING DATA; AND PERFORM CALCULATIONS IN ACCORDANCE WITH THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT, "RULE 69 NOX COMPLIANCE PROTOCOL FOR SOUTH BAY POWER STATION UNIT 1," AS APPROVED IN WRITING BY THE DISTRICT. (THE PERMITTEE MAY APPLY TO REVISE ANY SUCH NOX PROTOCOL AND, UPON WRITTEN APPROVAL BY THE DISTRICT, THE REVISED PROTOCOL SHALL REPLACE THE PREVIOUS PROTOCOL.
RULE(S):69.

24.CON'T FROM ABOVE
IN ADDITION, THE DISTRICT MAY REVISE THE NOX PROTOCOL TO ENSURE COMPLIANCE WITH ANY APPLICABLE REQUIREMENTS OF RULE 69.) THE CALCULATION METHODOLOGY OF THE NOX MONITORING PROTOCOL SHALL SPECIFY THE TIME OF COMPLETION AND RECORDING OF ALL CALCULATIONS. THE MONITORS SHALL BE IN FULL OPERATION AT ALL TIMES WHEN THE EQUIPMENT IS IN OPERATION EXCEPT FOR PERIODS, IF ANY, EXCLUDED IN THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT AS APPROVED IN WRITING BY THE DISTRICT. FOR EACH CALENDAR DAY AND CLOCK HOUR WHEN FUEL IS COMBUSTED, AT A MINIMUM, THE PERMITTEE SHALL PERFORM THE FOLLOWING AND, NO LATER THAN APRIL 1, 2004, OR THE EFFECTIVE IMPLEMENTATION DATE OF THE NOX MONITORING PROTOCOL, PERFORM THE FOLLOWING IN ACCORDANCE WITH THE MOST RECENT APPROVED NOX MONITORING PROTOCOL:
RULE(S):69.

25.CON'T FROM ABOVE
A. FOR EVERY 10-SECOND PERIOD, AT A MINIMUM, MEASURE AND SUM THE

PERMIT TO OPERATE

VALUES FOR GROSS ELECTRICAL POWER OUTPUT, NATURAL GAS FLOW RATE, LIQUID FUEL FLOW RATE, AMMONIA SOLUTION FLOW RATE, SCR OUTLET NOX CONCENTRATION UNCORRECTED FOR O2 CONCENTRATION, SCR OUTLET O2 PERCENTAGE, AND THE SCR INLET TEMPERATURE AND CALCULATE AND SUM THE FUEL HEAT INPUT RATES, SCR OUTLET NOX CONCENTRATION CORRECTED TO 3% O2, AND NOX MASS EMISSION RATE;
RULE(S):69.

26.CON'T FROM ABOVE
FOR EACH CLOCK HOUR, CALCULATE AND RECORD THE AVERAGE VALUES FOR THE GROSS ELECTRICAL POWER OUTPUT, NATURAL GAS FLOW RATE, LIQUID FUEL FLOW RATE, FUEL HEAT INPUT RATES, AMMONIA SOLUTION FLOW RATE, SCR OUTLET NOX CONCENTRATION UNCORRECTED FOR O2 PERCENTAGE, SCR OUTLET NOX CONCENTRATION CORRECTED TO 3% O2, THE SCR OUTLET O2 CONCENTRATION, THE SCR INLET TEMPERATURE, THE NOX EMISSION RATE EXPRESSED IN POUNDS PER HOUR AND THE PORTION OF TIME DURING THE CLOCK HOUR THAT THE EQUIPMENT WAS OPERATIONAL;
RULE(S):69.

27.CON'T FROM ABOVE
C. FOR EACH CALENDAR DAY IN WHICH A STARTUP OR SHUTDOWN OCCURS AND THE PERMITTEE ELECTS TO BASE COMPLIANCE ON A RETROSPECTIVE 24-HOUR AVERAGE, CALCULATE AND RECORD WITHIN 30 CALENDAR DAYS OF THE END OF THAT CALENDAR DAY THE RETROSPECTIVE 24-HOUR NOX EMISSION LIMIT, TOTAL NOX EMITTED FOR THE RETROSPECTIVE 24-HOUR PERIODEXPRESSED IN POUNDS, TOTAL GROSS ELECTRICAL ENERGY GENERATION OUTPUT FOR THE RETROSPECTIVE 24-HOUR PERIOD EXPRESSED IN MEGAWATT-HOURS, AND THE RETROSPECTIVE 24-HOUR AVERAGE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR;
RULE(S):69.

28.CON'T FROM ABOVE
D. FOR EACH CALENDAR DAY IN WHICH A STARTUP OR SHUTDOWN OCCURS AND THE PERMITTEE ELECTS TO BASE COMPLIANCE ON A PROSPECTIVE 24-HOUR AVERAGE, CALCULATE AND RECORD WITHIN 30 CALENDAR DAYS OF THE DATE THAT THE APPLICABLE 24-HOUR PERIOD ENDS THE PROSPECTIVE 24-HOUR NOX EMISSION LIMIT, TOTAL NOX EMITTED FOR THE PROSPECTIVE 24-HOUR PERIOD EXPRESSED IN POUNDS, TOTAL GROSS ELECTRICAL ENERGY GENERATION OUTPUT FOR THE PROSPECTIVE 24-HOUR PERIOD EXPRESSED IN MEGAWATT-HOURS, AND THE PROSPECTIVE 24-HOUR AVERAGE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR;
RULE(S):69.

PERMIT TO OPERATE

29.CON'T FROM ABOVE

E. FOR EACH CALENDAR DAY, CALCULATE AND RECORD THE RULE 69 NOX EMISSION LIMIT, THE TOTAL NOX EMITTED EXPRESSED IN POUNDS, THE TOTAL GROSS ELECTRICAL ENERGYGENERATION OUTPUT EXPRESSED IN MEGAWATT-HOURS, AND THE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR DURING OPERATION OF THIS EQUIPMENT; AND

F. FOR EACH CLOCK HOUR OR EACH CALENDAR-DAY, MEASURE, CALCULATE, AND RECORD THE AVERAGE VALUE OF ANY OTHER INFORMATION AS SPECIFIED IN THE RULE 69 NOX COMPLIANCE PROTOCOL FOR THIS EQUIPMENT.
RULE(S):69.

30. THE HIGHER HEATING VALUE OF NATURAL GAS USED IN THIS EQUIPMENT SHALL BE THE VALUE REPORTED BY THE UTILITY SUPPLYING THE NATURAL GAS TO THIS FACILITY DURING THE PREVIOUS CALENDAR MONTH THE HIGHER HEATING VALUE OF LIQUID FUEL USED IN THIS EQUIPMENT SHALL BE MEASURED AND RECORDED WHEN A NEW DELIVERY OF LIQUID FUEL RECEIVED.
RULE(S):69, 40 CFR PART 75.

31. WHEN FIRED ON NATURAL GAS, THE EMISSIONS OF AMMONIA, SHALL NOT EXCEED 10.5 PARTS PER MILLION BY VOLUME ON A DRY BASIS (PPMVD) CORRECTED TO 3% OXYGEN AND, WHEN FIRED ON LIQUID FUEL, THE EMISSIONS OF AMMONIA SHALL NOT EXCEED 10.5 PARTS PER MILLION BY VOLUME ON A DRY BASIS (PPMVD) CORRECTED TO 3% OXYGEN.
RULE(S):1200.

32. THE AMMONIA INJECTION FLOW RATE SHALL BE CONTINUOUSLY MONITORED, RECORDED, AND, EXCEPT AS PROVIDED FOR IN THE "SCR OPERATION CONDITION", CONTROLLED. THE PERMITTEE OF THIS EQUIPMENT SHALL RECORD THE DATE, DESCRIPTION, AND RESULTS OF ALL DEVICE QUALITY ASSURANCE TESTS, CALIBRATIONS, AND MAINTENANCE OF THE AMMONIA INJECTION AND MONITORING SYSTEM.
RULE(S):21.

33. ALL RECORDS REQUIRED BY THIS PERMIT SHALL BE KEPT FOR A MINIMUM OF FIVE (5) YEARS, MAINTAINED ON SITE, AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST. WHEN REQUESTED BY THE DISTRICT, RECORDS SHALL BE PROVIDED IN AN ELECTRONIC FORMAT ACCEPTABLE TO THE DISTRICT.
RULE(S):1421.

34. WHEN OPERATING, THIS EQUIPMENT SHALL BE IN COMPLIANCE WITH DISTRICT RULE 68. THE PERMITTEE SHALL MAINTAIN RECORDS IN ACCORDANCE WITH

PERMIT TO OPERATE

RULE 68 TO VERIFY COMPLIANCE.
RULE(S):68.

35. THIS EQUIPMENT SHALL BE SOURCE TESTED AT LEAST ONCE PER PERMIT YEAR BEFORE THE PERMIT TO OPERATE RENEWAL DATE, TO DEMONSTRATE COMPLIANCE WITH THE AMMONIA EMISSION STANDARD OF THIS PERMIT, USING DISTRICT APPROVED METHODS, UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT.
RULE(S):21.

36. WHEN BURNING LIQUID FUEL THE PERMITTEE SHALL SAMPLE THE LIQUID FUEL AS CLOSE AS SAFE AND PRACTICABLE TO THE BURNER TIP IN EACH CALENDAR DAY THAT LIQUID FUEL IS BURNED IF: (1) NO LIQUID FUEL SULFUR CONTENT ANALYSIS OF A SAMPLE TAKEN SUBSEQUENT TO THE COMPLETION OF THE MOST RECENT FUEL DELIVERY IS AVAILABLE FOR ANY TANK SUPPLYING FUEL TO THIS EQUIPMENT, (2) THE SULFUR CONTENT OF ANY TANK SUPPLYING FUEL TO THIS EQUIPMENT IS GREATER THAN 0.5 PERCENT BY WEIGHT BASED ON THE MOST RECENT AVAILABLE ANALYSIS OF A SAMPLE FROM THE TANK,
RULE(S):1421, 62, 40 CFR PART 75.

37.CON'T FROM ABOVE
OR (3) AT THE
ELECTION OF THE PERMITTEE. ALL LIQUID FUEL SHALL BE SAMPLED BY A METHOD IN ACCORDANCE WITH 40 CFR PART 75 OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA. ALL FUEL SAMPLES SHALL BE ANALYZED FOR SULFUR CONTENT NO LATER THAN 30 CALENDAR DAYS OF BEING SAMPLED OR, AT THE REQUEST OF THE DISTRICT OR EPA, ANALYZED FOR SULFUR CONTENT NO LATER THAN FIVE CALENDAR DAYS FROM THE DATE OF THE SAMPLE. THE SULFUR CONTENT OF ANY LIQUID FUEL SHALL BE MEASURED IN ACCORDANCE WITH ASTM D4294-90, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY ENERGY-DISPERSIVE X-RAY FLUORESCENCE SPECTROSCOPY," ASTM D2622-92, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY X-RAY SPECTROMETRY," OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.
RULE(S):40 CFR PART 75, 1421, 62.

38.CON'T FROM ABOVE
THE PERMITTEE SHALL MAINTAIN RECORDS OF THE RESULTS OF EACH DAILY SULFUR ANALYSIS FOR FUEL SUPPLIED TO THE BURNER TIP AND EACH ANALYSIS OF STORAGE TANK FUEL INCLUDING, AT A MINIMUM, THE DATE OF THE SAMPLE; THE DATE OF FUEL DELIVERY TO THE STORAGE TANK, IF APPLICABLE; AND SULFUR ANALYSIS RESULTS, AND THE TEST METHOD USED.
RULE(S):62, 40 CFR PART 75, 1421.

39. THE HIGHER HEATING VALUE OF LIQUID FUEL SHALL BE DETERMINED IN

PERMIT TO OPERATE

ACCORDANCE WITH 40 CFR PART 75 APPENDIX D METHODS FOR DETERMINING LIQUID FUEL GROSS CALORIFIC VALUE (HEAT CONTENT).
RULE(S):TITLE IV, 21.

40. AT THE REQUEST OF THE DISTRICT OR EPA, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH EPA METHOD 5, "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA. A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE REQUESTOR SHALL BE USED FOR THIS PURPOSE.
RULE(S):1421.

41. THE PERMITTEE SHALL HAVE A CONTINUOUS OPACITY MONITORING SYSTEM (COMS) INSTALLED AND MAINTAINED IN ACCORDANCE WITH RULE 19.2 ON THE EXHAUST STACK FOR THE PRODUCTS OF COMBUSTION FROM THIS EQUIPMENT. WHEN BURNING LIQUID FUEL, THE PERMITTEE SHALL OPERATE THIS COMS IN ACCORDANCE WITH RULE 19.2
RULE(S):50, 19.2.

42. PERMITTEE SHALL ACCOMPLISH BOILER LIGHT OFF WITH NATURAL GAS FUEL ONLY, EXCEPT IN THE EVENT OF ACTUAL INTERRUPTION OF THE NATURAL GAS SUPPLY FOR BOILER LIGHT OFF. THE DISTRICT SHALL BE NOTIFIED WHEN A FUEL OTHER THAN NATURAL GAS IS USED FOR BOILER LIGHT OFF.
RULE(S):51.

43. EVERY EFFORT SHALL BE MADE TO SCHEDULE AND CONDUCT SOOT-BLOWING WHEN THE WIND DIRECTION IS NOT TOWARD A FALLOUT SENSITIVE AREA.

B. DISTRICT-ONLY--ENFORCEABLE CONDITIONS

44. AT THE REQUEST OF THE DISTRICT, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH DISTRICT METHOD 5 "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE DISTRICT SHALL BE USED FOR THIS PURPOSE.
RULE(S):53.

45. AT LEAST ONCE EACH CALENDAR DAY IN WHICH THE BOILER IS OPERATED FOR SIX HOURS OR MORE, THE PERMITTEE SHALL CONDUCT A LEAK INSPECTION OF ALL ACCESSIBLE EXTERNAL SURFACE AREAS OF ALL EQUIPMENT INCLUDING, BUT NOT LIMITED TO, THE FURNACE, BOILER, ECONOMIZER, AND COMBUTION EXHAUST GAS DUCTING-THAT IS LOCATED BEFORE THE EXIT OF THE SCR AND WHERE A POSITIVE PRESSURE DIFFERENTIAL EXISTS BETWEEN THE PRODUCTS OF COMBUSTION AND THE AMBIENT ATMOSPHERE, IF ANY. FOR INSULATED

PERMIT TO OPERATE

AREAS, THE EXTERNAL SURFACE AREA IS THE EXTERNAL SURFACE OF THE INSULATION. THE LEAK INSPECTION AREAS EXCLUDE AREAS OPERATING AT LESS THAN ATMOSPHERIC PRESSURE AND THOSE AREAS CONTROLLED WITH AN OPERATING SEALING AIR SYSTEM. IN ADDITION, AT LEAST ONCE EVERY TWO CALENDAR YEARS THE PERMITTEE SHALL CONDUCT A SURVEY OF THESE LEAK INSPECTION AREAS WITH INFRARED THERMOGRAPHY OR AN EQUIVALENT METHOD.
RULE(S):21, 69.

46.CON'T FROM ABOVE
FOR EACH LEAK DISCOVERED IN THE LEAK INSPECTION AREA THAT HAS A VISIBLE LEAK AREA GREATER THAN 1.0 SQUARE FEET, THE PERMITTEE SHALL NOTIFY THE DISTRICT COMPLIANCE DIVISION WITHIN 2 HOURS OF THE DISCOVERY AND PROVIDE THE DISTRICT WITH THE APPROXIMATE DIMENSIONS AND LOCATION OF THE LEAK AND PROPOSED TIME FOR REPAIR. AT A MINIMUM, THE PERMITTEE SHALL REPAIR AS SOON AS PRACTICABLE ANY LEAKS DISCOVERED IN THE LEAK INSPECTION AREA LARGER THAN 0.3 SQUARE FEET AND ANY LEAKS NECESSARY TO MAINTAIN COMPLIANCE WITH RULE 69 EMISSION LIMITATIONS. THE PERMITTEE SHALL MAINTAIN A LOG THAT, FOR EACH LEAK REPAIRED, RECORDS: THE DATE OF DISCOVERY; A DESCRIPTION THAT INCLUDES THE LEAK'S MAXIMUM LENGTH AND WIDTH AS DETERMINED DURING THE REPAIR, THE LEAK'S LOCATION, AS DETERMINED DURING REPAIR; THE DATE REPAIR IS COMPLETED; AND THE NATURE OF THE REPAIR.
RULE(S):69, 21.

47.CON'T FROM ABOVE
IN ADDITION, THE PERMITTEE SHALL MAINTAIN A LOG THAT RECORDS THE DATE OF ANY MALFUNCTIONS, MAINTENANCE, AND REPAIR OF THE SEALING AIR SYSTEM. IN THE ABSENCE OF OTHER INFORMATION, A LEAK'S CROSS SECTIONAL FLOW AREA FOR DETERMINING LEAK RATE SHALL BE THE MAXIMUM LENGTH OF THE LEAK TIMES THE MAXIMUM WIDTH OF THE LEAK. NOTWITHSTANDING THE APPROVED PROTOCOL, EMISSIONS FROM LEAKS OF COMBUSTION PRODUCTS PRIOR TO TREATMENT IN THE SCR MAY BE CONSIDERED BY THE DISTRICT WHEN DETERMINING COMPLIANCE WITH ANY APPLICABLE EMISSION LIMIT.
RULE(S):21, 69.

48. THIS AIR POLLUTION CONTROL DISTRICT PERMIT DOES NOT RELIEVE THE HOLDER FROM OBTAINING PERMITS OR AUTHORIZATIONS REQUIRED BY OTHER GOVERNMENTAL AGENCIES.

49. THE PERMITTEE, SHALL UPON DETERMINATION OF APPLICABILITY AND WRITTEN NOTIFICATION BY THE DISTRICT, COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE AIR TOXICS 'HOT SPOTS' INFORMATION AND ASSESSMENT ACT (CALIFORNIA HEALTH AND

CONTROL NO.
274866

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

PERMIT NO
001201
EXPIRES
MARCH 2007

PERMIT TO OPERATE

SAFETY CODE SECTION 44300 ET.SEQ.).

CONTROL NO.
274867

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

PERMIT NO
001202
EXPIRES
MARCH 2007

PERMIT TO OPERATE

THE FOLLOWING IS HEREBY GRANTED A PERMIT TO OPERATE THE ARTICLE,MACHINE,EQUIPMENT OR CONTRIVANCE DESCRIBED BELOW. THIS PERMIT IS NOT TRANSFERABLE TO A NEW OWNER NOR IS IT VALID FOR OPERATION OF THE EQUIPMENT AT ANOTHER LOCATION, EXCEPT AS SPECIFIED. THIS PERMIT TO OPERATE OR A COPY MUST BE POSTED ON OR WITHIN 25 FEET OF THE OF THE EQUIPMENT, OR READILY AVAILABLE, ON THE OPERATING PREMISES.

PERMITTEE		EQUIPMENT ADDRESS	
LSP SOUTH BAY LLC		LSP SOUTH BAY LLC	
JIM NYLANDER			
990 BAY BL		990 BAY BL	
CHULA VISTA CA	91911-1651	CHULA VISTA CA	91911-0000

EQUIPMENT DESCRIPTION REVISED COPY

UTILITY BOILER NO. 4: COMBUSTION ENG, 2900 MM BTU/HOUR INPUT, RESIDUAL OIL AND/ OR NATURAL GAS FIRED, S/N 22607-72, WITH COMBUSTION NOX CONTROL ENHACEMENTS, WATER & STEAM INJECTION SYSTEMS, WITH SELECTIC CATALYTIC REDUCTION (SCR) USING AQUEOUS AMMONIA AND AMMONIA INJECTION NOX CONTROL SYSTEM; GRASEBY/STI CONTINUOUS EMISSION MONITORING SYSTEM AND ASSOCIATED SOFTWARE. ASSOCIATED AMMONIA INJECTION SYSTEM AND EVAPORATION SKID, ASSOCIATED AMMONIA INJECTION CONTROL AND MONITORING EQUIPMENT, AND ANCILLARY EQUIPMENT.

Sector#:17 ID#:00334A PO#:001202 BEC#:12586
Fee Schedules: 13D01 92G01 92I01

EVERY PERSON WHO OWNS OR OPERATES THIS EQUIPMENT IS REQUIRED TO COMPLY WITH THE CONDITIONS LISTED BELOW AND ALL APPLICABLE REQUIREMENTS AND DISTRICT RULES, INCLUDING BUT NOT LIMITED TO RULE(S) 19.2, 53, 62, 68, 69.

FAILURE TO OPERATE IN COMPLIANCE IS A MISDEMEANOR SUBJECT TO CIVIL AND CRIMINAL PENALTIES.

A. FEDERALLY-ENFORCEABLE AND DISTRICT-ENFORCEABLE CONDITIONS

1. THE PERMITTEE SHALL COMPLY WITH RULE(S) 19.2, 50, 51, 53, 62, AND 68.
   RULE(S):1421.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND OPERATED IN ACCORDANCE WITH GOOD AIR POLLUTION CONTROL PRACTICES AT ALL TIMES.
   RULE(S):21.

3. THE PERMITTEE SHALL MAINTAIN THE STACK GAS PH AT 5.0 OR GREATER WHEN LIQUID FUEL IS BURNED. A 45.0 WT.% TO 55.0 WT.% CALCIUM NITRATE AQUEOUS SOLUTION, OR A 36.5 WT. % TO 46.5 WT. % MAGNESIUM OXIDE SLURRY, SHALL BE USED AS A FUEL ADDITIVE TO ENSURE STACK PH IS 5.0 OR

PERMIT TO OPERATE

GREATER. COMPLIANCE WITH THE WEIGHT PERCENT CONCENTRATION LIMITS MAY BE DEMONSTRATED BY MANUFACTURER'S CERTIFICATION FOR EACH DELIVERY. FUEL ADDITIVES AT HIGHER OR LOWER CONCENTRATION MAY BE USED IF PRIOR WRITTEN APPROVAL IS GRANTED BY THE DISTRICT. A MATERIAL SAFETY DATA SHEET OF EACH ADDITIVE AND EACH MANUFACTURER CERTIFICATION OF THE CONCENTRATION SHALL BE MAINTAINED ON SITE AND A COPY SHALL BE PROVIDED TO THE DISTRICT UPON REQUEST. IF LIQUID FUEL WILL BE BURNED FOR 24 CONSECUTIVE HOURS OR MORE, STACK GAS PH SHALL BE MEASURED IN ACCORDANCE WITH A DISTRICT APPROVED TEST METHOD, WITHIN THAT PERIOD AND ONCE WITHIN EVERY 24-HOUR PERIOD THEREAFTER UNTIL LIQUID FUEL IS NO LONGER BURNED.
RULE(S):51.

4.CON'T FROM ABOVE
IF LIQUID FUEL WILL
BE BURNED FOR LESS THAN 24 CONSECUTIVE HOURS BUT MORE THAN 12 CONSECUTIVE HOURS, STACK GAS PH SHALL BE MEASURED IN ACCORDANCE WITH INSTRUCTION NO. 5.240.0 REV. NO. 0, "RELATIVE ACIDITY MEASUREMENT (STACK GAS TESTING) IN THE "SDG&E OPERATING SYSTEMS ANALYSIS PROCEDURES MANUAL," OR WITH AN ALTERNATIVE DISTRICT-APPROVED TEST METHOD, AS SOON AS PRACTICAL AFTER THE CONCLUSION OF THE BURN BUT NOT LATER THAN 24 HOURS FROM THE BEGINNING OF THE OIL BURN. THE PERMITTEE SHALL MAINTAIN A COPY OF THE APPROVED TEST METHOD ON SITE AND MAKE IT AVAILABLE TO THE DISTRICT UPON REQUEST. THE STACK GAS PH, DATE, TIME, AND TEST METHOD USED FOR THE MEASUREMENT SHALL BE RECORDED FOR EACH MEASUREMENT.
RULE(S):51.

5. LIQUID FUEL SULFUR CONTENT SHALL NOT EXCEED 0.5% SULFUR BY WEIGHT AT THE BURNER TIP.
RULE(S):62.

6. THE PERMITTEE SHALL NOTIFY THE AIR POLLUTION CONTROL DISTRICT OF EACH FORMAL DAMAGE CLAIM THAT CAN BE ASSOCIATED WITH ACID FALLOUT WITHIN TEN (10) DAYS OF EACH SUCH OCCURRENCE.
RULE(S):51.

7. ALL SOURCE TESTS REQUIRED FOR THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT:

A. FOR MEASUREMENTS OF OXIDES OF NITROGEN AND STACK GAS OXYGEN CONTENT THE SOURCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH DISTRICT METHOD 100, "TEST PROCEDURES FOR THE DETERMINATION OF NOX, CO, AND DILUENT GASES BY CONTINUOUS

PERMIT TO OPERATE

EMISSION MONITORING," DATED MAY 1995,AS APPROVED BY THE EPA, AND EPA METHOD 7E, DETERMINATION OF NITROGEN OXIDES EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA, AND THE APPLICABLE PROVISIONS SPECIFIED IN 40 CFR PART 75.
RULE(S):21, 69, 40 CFR PART 75.

8.CON'T FROM ABOVE

B. FOR MEASUREMENTS OF AMMONIA, THE SOURCE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH BAY AREA AIR QUALITY MANAGEMENT DISTRICT (BAAQMD) METHOD ST-1B, "AMMONIA, CONTINUOUS SAMPLING," DATED JANUARY 20, 1982, AS APPROVED BY THE EPA OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.

C. SOURCE TESTING SHALL BE PERFORMED AT NO LESS THAN 80% OF THE BOILER RATING OR IN ACCORDANCE WITH THE SOURCE TEST LOAD REQUIREMENTS OF 40 CFR PART 75.
RULE(S):40 CFR PART 75, 21, 69.

9.CON'T FROM ABOVE

MEASUREMENTS OF OXIDES OF NITROGEN, STACK GAS OXYGEN CONTENT, AND AMMONIA SHALL BE MADE CONCURRENTLY.

FOR EACH SOURCE TEST, A SOURCE TEST PROTOCOL SHALL BE SUBMITTED TO THE DISTRICT FOR WRITTEN APPROVAL AT LEAST 30 DAYS PRIOR TO THE DATE OF THE SOURCE TEST AND, WITHIN 30 DAYS AFTER COMPLETION OF THE SOURCE TEST, A FINAL TEST REPORT SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL, UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT.
RULE(S):21, 69, 40 CFR PART 75.

10. EXCEPT FOR CHANGES THAT ARE SPECIFIED IN THE INITIAL APPROVED NOX MONITORING PROTOCOL OR A SUBSEQUENT REVISION TO THAT PROTOCOL THAT IS APPROVED IN ADVANCE, IN WRITING, BY THE DISTRICT, THE DISTRICT SHALL BE NOTIFIED IN WRITING AT LEAST THIRTY (30) DAYS PRIOR TO ANY PLANNED CHANGES MADE IN THE CEMS/DAHS (INCLUDING THE PROGRAMMABLE LOGIC CONTROLLER) SOFTWARE WHICH AFFECTS THE VALUE OF DATA DISPLAYED ON THE CEMS/DAHS MONITORS WITH RESPECT TO THE PARAMETERS MEASURED BY THEIR RESPECTIVE SENSING DEVICES OR ANY PLANNED CHANGES TO THE SOFTWARE THAT CONTROLS THE AMMONIA FLOW TO THE SCR. UNPLANNED OR EMERGENCY CHANGES SHALL BE REPORTED TO THE DISTRICT WITHIN 96 HOURS.
RULE(S):21.

11. THIS EQUIPMENT SHALL ONLY BE FIRED WITH NATURAL GAS EXCEPT THAT LIQUID

PERMIT TO OPERATE

FUEL MAY BE FIRED WHEN NATURAL GAS IS NOT AVAILABLE DUE TO A FORCE MAJEURE NATURAL GAS CURTAILMENT, AS DEFINED BY DISTRICT RULE 69, AND LIQUID FUEL MAY BE FIRED UP TO A TOTAL OF 160 HOURS IN A CALENDAR YEAR FOR OPERATIONAL AND RELIABILITY TESTING AND FOR COMPLIANCE EMISSIONS TESTING REQUIRED BY THE DISTRICT.
RULE(S):CEQA.

12. THE CEMS TO MONITOR NOX AND O2 REQUIRED BY THIS PERMIT SHALL MEET ALL THE APPLICABLE PERFORMANCE, INSTALLATION, CERTIFICATION, AND QUALITY ASSURANCE AND QUALITY CONTROL PROVISIONS SPECIFIED IN 40 CFR PART 75 APPENDICES A AND B AND BE OPERATED IN ACCORDANCE WITH 40 CFR PART 60.13. FUEL FLOW MONITORS REQUIRED BY THIS PERMIT SHALL MEET ALL APPLICABLE PERFORMANCE, INSTALLATION, CERTIFICATION, CALIBRATION, AND QUALITY ASSURANCE AND QUALITY CONTROL PROVISIONS SPECIFIED IN OF 40 CFR PART 75.
RULE(S):TITLE IV, 40 CFR PART 75, 21, 69.

13. NOX EMISSION LIMIT CONDITION. EXCEPT AS PROVIDED BELOW, FOR EACH CALENDAR DAY, THE AVERAGE MASS EMISSION RATE OF NOX PER UNIT OF ELECTRICAL ENERGY GENERATED FROM THIS EQUIPMENT WHEN FIRED ON EITHER NATURAL GAS, LIQUID FUEL, OR A COMBINATION OF BOTH SHALL NOT EXCEED THE RULE 69 NOX EMISSION LIMIT, IN POUNDS PER GROSS MEGAWATT-HOUR AVERAGED, OVER EACH CALENDAR DAY OF OPERATION. THE RULE 69 NOX EMISSION LIMIT AND, WHEN APPLICABLE, THE ALTERNATIVE RETROSPECTIVE AND PROSPECTIVE 24-HOUR NOX EMISSION LIMIT (SEE BELOW) SHALL BE DETERMINED AS FOLLOWS:
RULE(S):69.

14.CON'T FROM ABOVE

$$EL = [(0.15)(QG)(HHVG) + (0.40)(QO)(HHVO)]/[(QG)(HHVG) + (QO)(HHVO)]$$

WHERE: EL = NOX EMISSION LIMIT, IN POUNDS PER GROSS MEGAWATT-HOUR;
QG = NATURAL GAS FLOW RATE, 100 STANDARD CUBIC FEET PER HOUR;
HHVG = NATURAL GAS HIGHER HEATING VALUE, IN BTU PER 100 STANDARD CUBIC FEET;
QO = LIQUID FUEL FLOW RATE, IN POUNDS PER HOUR; AND
HHVO = LIQUID FUEL HIGHER HEATING VALUE, IN BTU PER POUND;

AND WHERE QG, HHVG, HHVO, AND QO ARE AVERAGED OVER A CALENDAR DAY FOR DETERMINING COMPLIANCE BASED ON A CALENDAR DAY AVERAGE FOR THE RULE 69 LIMIT AND OVER THE APPLICABLE 24- AND SHUTDOWNS.OR PROSPECTIVE 24-HOUR AVERAGE FOR STARTUPS
RULE(S):69.

15.CON'T FROM ABOVE

PERMIT TO OPERATE

FOR CALENDAR DAYS IN WHICH A STARTUP(S) OR SHUTDOWN(S) OCCURS, THE MASS EMISSION RATE OF NOX PER UNIT OF GROSS ELECTRICAL ENERGY GENERATED FROM THIS EQUIPMENT WHEN FIRED ON EITHER NATURAL GAS, LIQUID FUEL, OR A COMBINATION OF BOTH SHALL NOT EXCEED ONE OF THE FOLLOWING THREE ALTERNATIVE LIMITS:

A. THE RULE 69 NOX EMISSION LIMIT FOR THE CALENDAR DAY, AS DETERMINED ABOVE; OR
RULE(S):69.

16.CON'T FROM ABOVE
B. BEGINNING WITH THE LAST NONEXCLUDED (FOR PERIODS EXCLUDED FROM EMISSION LIMIT AND EMISSION RATE AVERAGES SEE D. AND E. OF THIS CONDITION) 10-CLOCK-SECOND PERIOD IN THE CALENDAR DAY, A NOX EMISSION LIMIT, AS DETERMINED ABOVE, BASED ON THE AVERAGE OF THE PRECEDING 24 HOURS THAT HAVE AT LEAST ONE NONEXCLUDED 10-CLOCK-SECOND PERIOD (RETROSPECTIVE 24-HOUR AVERAGE); OR

C. BEGINNING WITH THE FIRST NONEXCLUDED 10-CLOCK-SECOND PERIOD IN THE CALENDAR DAY, A NOX EMISSION LIMIT, AS DETERMINED ABOVE, BASED ON THE AVERAGE OF THE SUCCEEDING 24 HOURS THAT HAVE AT LEAST ONE NONEXCLUDED 10-CLOCK-SECOND PERIOD (PROSPECTIVE 24-HOUR AVERAGE).
RULE(S):69.

17.CON'T FROM ABOVE
FOR EACH CALENDAR DAY IN WHICH A STARTUP(S) OR SHUTDOWN(S) OCCURS, THE PERMITTEE MAY ELECT TO BASE COMPLIANCE ON ANY ONE OF THESE THREE ALTERNATIVES. FOR PURPOSES OF THIS PERMIT, A STARTUP OR SHUTDOWN DURING A CALENDAR DAY OCCURS IF NO FUEL IS COMBUSTED FOR A PERIOD OF AT LEAST 60 CONSECUTIVE CLOCK MINUTES DURING THE CALENDAR DAY.

THE CALENDAR-DAY AND RETROSPECTIVE AND PROSPECTIVE 24-HOUR AVERAGE MASS EMISSION RATE OF NOX PER UNIT OF GROSS ELECTRICAL ENERGY GENERATED SHALL BE AVERAGED OVER THE SAME TIME PERIOD AS THE APPLICABLE NOX EMISSION LIMIT, BASED ON CEMS AND OTHER CONTINUOUS MONITORING DATA, AND CALCULATED IN ACCORDANCE WITH THE MOST RECENT NOX MONITORING PROTOCOL APPROVED IN WRITING BY THE DISTRICT.
RULE(S):69.

18.CON'T FROM ABOVE
THE FOLLOWING TIME PERIODS SHALL BE EXCLUDED FROM THE CALENDAR DAY AND RETROSPECTIVE AND PROSPECTIVE 24-HOUR AVERAGES OF NOX

PERMIT TO OPERATE

EMISSION LIMITS AND EMISSION RATES:

D. NOTWITHSTANDING THE NOX MONITORING PROTOCOL, ANY PORTION OF A CLOCK HOUR, INCLUDING AN ENTIRE CLOCK HOUR, IF APPLICABLE, WHEN THERE IS NO ELECTRICAL GENERATION BY THE STEAM TURBINE GENERATOR OR NO FUEL IS BEING COMBUSTED; AND

E. ANY OTHER PERIODS, IF ANY, THAT ARE SPECIFIED AS EXCLUDED IN THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT AS APPROVED IN WRITING BY THE DISTRICT.
RULE(S):69.

19. THE PERMITTEE SHALL MAINTAIN CALENDAR DAY RECORDS THAT RECORD THE TIME TO THE NEAREST CLOCK MINUTE THAT ELECTRICAL GENERATION COMMENCED AND ELECTRICAL GENERATION ENDED. FOR PURPOSES OF ALL CONDITIONS IN THIS PERMIT, ELECTRICAL GENERATION COMMENCES WHEN GROSS ELECTRICAL POWER OUTPUT FROM THE STEAM TURBINE GENERATOR EQUALS OR EXCEEDS 2.0 MEGAWATT (MW) AND ENDS WHEN GROSS ELECTRICAL POWER OUTPUT FROM THE STEAM TURBINE GENERATOR IS LESS THAN 2.0 MW.
RULE(S):21, 69.

20. SCR OPERATION CONDITION. AT ALL TIMES WHEN FUEL IS BEING COMBUSTED, ALL COMBUSTION EMISSIONS FROM THE BOILER SHALL BE VENTED TO THE SCR SYSTEM. THE SCR SHALL BE IN FULL OPERATION WHEN THE SCR SYSTEM INLET TEMPERATURE EQUALS OR EXCEEDS 500 DEGREES F WHEN FIRING NATURAL GAS OR 570 DEGREES F WHEN FIRING LIQUID FUEL EXCEPT FOR PERIODS OF REPAIR OR MAINTENANCE TO THE SCR SYSTEM OR RECOVERY OF NORMAL BOILER OPERATIONS FOLLOWING AN INADVERTENT FLAMEOUT. FOR THE ENTIRE DURATION OF SUCH REPAIR , MAINTENANCE, OR INADVERTENT FLAMEOUT PERIODS, ALL OF THE FOLLOWING MUST BE SATISFIED: (1) THE CEMS SHALL BE IN CONTINUOUS OPERATION; (2) NO PERIODS EXCLUDED FROM CALCULATION OF THE NOX MASS EMISSION LIMIT OR EMISSION RATE AS SPECIFIED IN THE "NOX EMISSION LIMIT CONDITION" OR THE APPROVED NOX MONITORING PROTOCOL SHALL OCCUR EXCEPT A PERIOD DURING WHICH THE CEMS PROBE IS BEING PURGED NOT TO EXCEED FIVE CLOCK MINUTES IN ANY CLOCK HOUR;
RULE(S):69.

21.CON'T FROM ABOVE
AND (3) FOR EACH CALENDAR DAY ON WHICH THE SCR SYSTEM REPAIR OR MAINTENANCE IS PERFORMED OR RECOVERY OF NORMAL OPERATIONS FOLLOWING AN INADVERTENT FLAMEOUT OCCURS, THE "NOX EMISSION LIMIT CONDITION" IS COMPLIED WITH. THE PERMITTEE SHALL MAINTAIN A LOG INDICATING THE DATE AND TIME PERIODS OF ALL SUCH SCR

PERMIT TO OPERATE

SYSTEM MAINTENANCE OR REPAIR AND THE NATURE OF THE MAINTENANCE OR REPAIR PERFORMED.
RULE(S):69.

22. THE PERMITTEE SHALL PROVIDE, AS PART OF THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT, A DESCRIPTION OF ALL EXTERNAL SURFACE AREAS OF ALL EQUIPMENT OF THE SCR AND WHERE A POSITIVE PRESSURE DIFFERENTIAL EXISTS BETWEEN THE PRODUCTS OF COMBUSTION AND THE AMBIENT ATMOSPHERE, ALL SUCH AREAS OPERATING AT LESS THAN ATMOSPHERIC PRESSURE, AND ALL SUCH AREAS CONTROLLED WITH A SEALING AIR SYSTEM.
RULE(S):69.

23. THIS EQUIPMENT SHALL BE EQUIPPED WITH CONTINUOUS MONITORS, AND ASSOCIATED DATA COLLECTION, PROCESSING AND STORAGE SYSTEMS, WHICH RECORD AND PRESERVE ALL INFORMATION NECESSARY TO DEMONSTRATE COMPLIANCE WITH DISTRICT RULE 69. THESE CONTINUOUS MONITORS, INCLUDING ANY IDENTIFIED ALTERNATIVE MONITORS USED WHEN A PRIMARY MONITOR IS UNAVAILABLE, AND ASSOCIATED DATA COLLECTION, PROCESSING AND STORAGE SYSTEMS SHALL, AS APPLICABLE, BE INSTALLED, CERTIFIED, CALIBRATED, AND OPERATED; PROCESS MONITORING DATA; AND PERFORM CALCULATIONS IN ACCORDANCE WITH THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT, "RULE 69 NOX COMPLIANCE PROTOCOL FOR SOUTH BAY POWER STATION UNIT 1," AS APPROVED IN WRITING BY THE DISTRICT. (THE PERMITTEE MAY APPLY TO REVISE ANY SUCH NOX PROTOCOL AND, UPON WRITTEN APPROVAL BY THE DISTRICT, THE REVISED PROTOCOL SHALL REPLACE THE PREVIOUS PROTOCOL.
RULE(S):69.

24.CON'T FROM ABOVE
IN ADDITION, THE DISTRICT MAY REVISE
THE NOX PROTOCOL TO ENSURE COMPLIANCE WITH ANY APPLICABLE REQUIREMENTS OF RULE 69.) THE CALCULATION METHODOLOGY OF THE NOX MONITORING PROTOCOL SHALL SPECIFY THE TIME OF COMPLETION AND RECORDING OF ALL CALCULATIONS. THE MONITORS SHALL BE IN FULL OPERATION AT ALL TIMES WHEN THE EQUIPMENT IS IN OPERATION EXCEPT FOR PERIODS, IF ANY, EXCLUDED IN THE NOX MONITORING PROTOCOL FOR THIS EQUIPMENT AS APPROVED IN WRITING BY THE DISTRICT. FOR EACH CALENDAR DAY AND CLOCK HOUR WHEN FUEL IS COMBUSTED, AT A MINIMUM, THE PERMITTEE SHALL PERFORM THE FOLLOWING AND, NO LATER THAN APRIL 1, 2004, OR THE EFFECTIVE IMPLEMENTATION DATE OF THE NOX MONITORING PROTOCOL, PERFORM THE FOLLOWING IN ACCORDANCE WITH THE MOST RECENT APPROVED NOX MONITORING PROTOCOL:
RULE(S):69.

25.CON'T FROM ABOVE

PERMIT NO

PERMIT TO OPERATE

A. FOR EVERY 10-SECOND PERIOD, AT A MINIMUM, MEASURE AND SUM THE VALUES FOR GROSS ELECTRICAL POWER OUTPUT, NATURAL GAS FLOW RATE, LIQUID FUEL FLOW RATE, AMMONIA SOLUTION FLOW RATE, SCR OUTLET NOX CONCENTRATION UNCORRECTED FOR O2 CONCENTRATION, SCR OUTLET O2 PERCENTAGE, AND THE SCR INLET TEMPERATURE AND CALCULATE AND SUM THE FUEL HEAT INPUT RATES, SCR OUTLET NOX CONCENTRATION CORRECTED TO 3% O2, AND NOX MASS EMISSION RATE;
RULE(S):69.

26.CON'T FROM ABOVE
FOR EACH CLOCK HOUR, CALCULATE AND RECORD THE AVERAGE VALUES FOR THE GROSS ELECTRICAL POWER OUTPUT, NATURAL GAS FLOW RATE, LIQUID FUEL FLOW RATE, FUEL HEAT INPUT RATES, AMMONIA SOLUTION FLOW RATE, SCR OUTLET NOX CONCENTRATION UNCORRECTED FOR O2 PERCENTAGE, SCR OUTLET NOX CONCENTRATION CORRECTED TO 3% O2, THE SCR OUTLET O2 CONCENTRATION, THE SCR INLET TEMPERATURE, THE NOX EMISSION RATE EXPRESSED IN POUNDS PER HOUR AND THE PORTION OF TIME DURING THE CLOCK HOUR THAT THE EQUIPMENT WAS OPERATIONAL;
RULE(S):69.

27.CON'T FROM ABOVE
C. FOR EACH CALENDAR DAY IN WHICH A STARTUP OR SHUTDOWN OCCURS AND THE PERMITTEE ELECTS TO BASE COMPLIANCE ON A RETROSPECTIVE 24-HOUR AVERAGE, CALCULATE AND RECORD WITHIN 30 CALENDAR DAYS OF THE END OF THAT CALENDAR DAY THE RETROSPECTIVE 24-HOUR NOX EMISSION LIMIT, TOTAL NOX EMITTED FOR THE RETROSPECTIVE 24-HOUR PERIODEXPRESSED IN POUNDS, TOTAL GROSS ELECTRICAL ENERGY GENERATION OUTPUT FOR THE RETROSPECTIVE 24-HOUR PERIOD EXPRESSED IN MEGAWATT-HOURS, AND THE RETROSPECTIVE 24-HOUR AVERAGE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR;
RULE(S):69.

28.CON'T FROM ABOVE
D. FOR EACH CALENDAR DAY IN WHICH A STARTUP OR SHUTDOWN OCCURS AND THE PERMITTEE ELECTS TO BASE COMPLIANCE ON A PROSPECTIVE 24-HOUR AVERAGE, CALCULATE AND RECORD WITHIN 30 CALENDAR DAYS OF THE DATE THAT THE APPLICABLE 24-HOUR PERIOD ENDS THE PROSPECTIVE 24-HOUR NOX EMISSION LIMIT, TOTAL NOX EMITTED FOR THE PROSPECTIVE 24-HOUR PERIOD EXPRESSED IN POUNDS, TOTAL GROSS ELECTRICAL ENERGY GENERATION OUTPUT FOR THE PROSPECTIVE 24-HOUR PERIOD EXPRESSED IN MEGAWATT-HOURS, AND THE PROSPECTIVE 24-HOUR AVERAGE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR;

PERMIT TO OPERATE

RULE(S):69.

29.CON'T FROM ABOVE

E. FOR EACH CALENDAR DAY, CALCULATE AND RECORD THE RULE 69 NOX EMISSION LIMIT, THE TOTAL NOX EMITTED EXPRESSED IN POUNDS, THE TOTAL GROSS ELECTRICAL ENERGYGENERATION OUTPUT EXPRESSED IN MEGAWATT-HOURS, AND THE NOX EMISSION RATE EXPRESSED IN POUNDS PER GROSS MEGAWATT-HOUR DURING OPERATION OF THIS EQUIPMENT; AND

F. FOR EACH CLOCK HOUR OR EACH CALENDAR-DAY, MEASURE, CALCULATE, AND RECORD THE AVERAGE VALUE OF ANY OTHER INFORMATION AS SPECIFIED IN THE RULE 69 NOX COMPLIANCE PROTOCOL FOR THIS EQUIPMENT.
RULE(S):69.

30. THE HIGHER HEATING VALUE OF NATURAL GAS USED IN THIS EQUIPMENT SHALL BE THE VALUE REPORTED BY THE UTILITY SUPPLYING THE NATURAL GAS TO THIS FACILITY DURING THE PREVIOUS CALENDAR MONTH THE HIGHER HEATING VALUE OF LIQUID FUEL USED IN THIS EQUIPMENT SHALL BE MEASURED AND RECORDED WHEN A NEW DELIVERY OF LIQUID FUEL RECEIVED.
RULE(S):69, 40 CFR PART 75.

31. WHEN FIRED ON NATURAL GAS, THE EMISSIONS OF AMMONIA, SHALL NOT EXCEED 10 PARTS PER MILLION BY VOLUME ON A DRY BASIS (PPMVD) CORRECTED TO 3% OXYGEN AND, WHEN FIRED ON LIQUID FUEL, THE EMISSIONS OF AMMONIA SHALL NOT EXCEED 10 PARTS PER MILLION BY VOLUME ON A DRY BASIS (PPMVD) CORRECTED TO 3% OXYGEN.
RULE(S):1200.

32. THE AMMONIA INJECTION FLOW RATE SHALL BE CONTINUOUSLY MONITORED, RECORDED, AND, EXCEPT AS PROVIDED FOR IN THE "SCR OPERATION CONDITION", CONTROLLED. THE PERMITTEE OF THIS EQUIPMENT SHALL RECORD THE DATE, DESCRIPTION, AND RESULTS OF ALL DEVICE QUALITY ASSURANCE TESTS, CALIBRATIONS, AND MAINTENANCE OF THE AMMONIA INJECTION AND MONITORING SYSTEM.
RULE(S):21.

33. ALL RECORDS REQUIRED BY THIS PERMIT SHALL BE KEPT FOR A MINIMUM OF FIVE (5) YEARS, MAINTAINED ON SITE, AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST. WHEN REQUESTED BY THE DISTRICT, RECORDS SHALL BE PROVIDED IN AN ELECTRONIC FORMAT ACCEPTABLE TO THE DISTRICT.
RULE(S):1421.

34. WHEN OPERATING, THIS EQUIPMENT SHALL BE IN COMPLIANCE WITH DISTRICT

PERMIT TO OPERATE

RULE 68. THE PERMITTEE SHALL MAINTAIN RECORDS IN ACCORDANCE WITH RULE 68 TO VERIFY COMPLIANCE.
RULE(S):68.

35. THIS EQUIPMENT SHALL BE SOURCE TESTED AT LEAST ONCE PER PERMIT YEAR BEFORE THE PERMIT TO OPERATE RENEWAL DATE, TO DEMONSTRATE COMPLIANCE WITH THE AMMONIA EMISSION STANDARD OF THIS PERMIT, USING DISTRICT APPROVED METHODS, UNLESS OTHERWISE DIRECTED IN WRITING BY THE DISTRICT.
RULE(S):21.

36. WHEN BURNING LIQUID FUEL THE PERMITTEE SHALL SAMPLE THE LIQUID FUEL AS CLOSE AS SAFE AND PRACTICABLE TO THE BURNER TIP IN EACH CALENDAR DAY THAT LIQUID FUEL IS BURNED IF: (1) NO LIQUID FUEL SULFUR CONTENT ANALYSIS OF A SAMPLE TAKEN SUBSEQUENT TO THE COMPLETION OF THE MOST RECENT FUEL DELIVERY IS AVAILABLE FOR ANY TANK SUPPLYING FUEL TO THIS EQUIPMENT, (2) THE SULFUR CONTENT OF ANY TANK SUPPLYING FUEL TO THIS EQUIPMENT IS GREATER THAN 0.5 PERCENT BY WEIGHT BASED ON THE MOST RECENT AVAILABLE ANALYSIS OF A SAMPLE FROM THE TANK,
RULE(S):1421, 62, 40 CFR PART 75.

37.CON'T FROM ABOVE
OR (3) AT THE
ELECTION OF THE PERMITTEE. ALL LIQUID FUEL SHALL BE SAMPLED BY A METHOD IN ACCORDANCE WITH 40 CFR PART 75 OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA. ALL FUEL SAMPLES SHALL BE ANALYZED FOR SULFUR CONTENT NO LATER THAN 30 CALENDAR DAYS OF BEING SAMPLED OR, AT THE REQUEST OF THE DISTRICT OR EPA, ANALYZED FOR SULFUR CONTENT NO LATER THAN FIVE CALENDAR DAYS FROM THE DATE OF THE SAMPLE. THE SULFUR CONTENT OF ANY LIQUID FUEL SHALL BE MEASURED IN ACCORDANCE WITH ASTM D4294-90, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY ENERGY-DISPERSIVE X-RAY FLUORESCENCE SPECTROSCOPY," ASTM D2622-92, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY X-RAY SPECTROMETRY," OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.
RULE(S):40 CFR PART 75, 1421, 62.

38.CON'T FROM ABOVE
THE PERMITTEE SHALL MAINTAIN RECORDS OF THE RESULTS OF EACH DAILY SULFUR ANALYSIS FOR FUEL SUPPLIED TO THE BURNER TIP AND EACH ANALYSIS OF STORAGE TANK FUEL INCLUDING, AT A MINIMUM, THE DATE OF THE SAMPLE; THE DATE OF FUEL DELIVERY TO THE STORAGE TANK, IF APPLICABLE; AND SULFUR ANALYSIS RESULTS, AND THE TEST METHOD USED.
RULE(S):62, 40 CFR PART 75, 1421.

39. THE HIGHER HEATING VALUE OF LIQUID FUEL SHALL BE DETERMINED IN

PERMIT TO OPERATE

ACCORDANCE WITH 40 CFR PART 75 APPENDIX D METHODS FOR DETERMINING LIQUID FUEL GROSS CALORIFIC VALUE (HEAT CONTENT).
RULE(S):TITLE IV, 21.

40. AT THE REQUEST OF THE DISTRICT OR EPA, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH EPA METHOD 5, "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA. A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE REQUESTOR SHALL BE USED FOR THIS PURPOSE.
RULE(S):1421.

41. THE PERMITTEE SHALL HAVE A CONTINUOUS OPACITY MONITORING SYSTEM (COMS) INSTALLED AND MAINTAINED IN ACCORDANCE WITH RULE 19.2 ON THE EXHAUST STACK FOR THE PRODUCTS OF COMBUSTION FROM THIS EQUIPMENT. WHEN BURNING LIQUID FUEL, THE PERMITTEE SHALL OPERATE THIS COMS IN ACCORDANCE WITH RULE 19.2
RULE(S):50, 19.2.

42. PERMITTEE SHALL ACCOMPLISH BOILER LIGHT OFF WITH NATURAL GAS FUEL ONLY, EXCEPT IN THE EVENT OF ACTUAL INTERRUPTION OF THE NATURAL GAS SUPPLY FOR BOILER LIGHT OFF. THE DISTRICT SHALL BE NOTIFIED WHEN A FUEL OTHER THAN NATURAL GAS IS USED FOR BOILER LIGHT OFF.
RULE(S):51.

43. EVERY EFFORT SHALL BE MADE TO SCHEDULE AND CONDUCT SOOT-BLOWING WHEN THE WIND DIRECTION IS NOT TOWARD A FALLOUT SENSITIVE AREA.

B. DISTRICT-ONLY--ENFORCEABLE CONDITIONS

44. AT THE REQUEST OF THE DISTRICT, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH DISTRICT METHOD 5 "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE DISTRICT SHALL BE USED FOR THIS PURPOSE.
RULE(S):53.

45. AT LEAST ONCE EACH CALENDAR DAY IN WHICH THE BOILER IS OPERATED FOR SIX HOURS OR MORE, THE PERMITTEE SHALL CONDUCT A LEAK INSPECTION OF ALL ACCESSIBLE EXTERNAL SURFACE AREAS OF ALL EQUIPMENT-INCLUDING,BUT NOT LIMITED TO, THE FURNACE, BOILER, ECONOMIZER, AND COMBUSTION EXHAUST GAS DUCTING-THAT IS LOCATED BEFORE THE EXIT OF THE SCR AND WHERE A POSITIVE PRESSURE DIFFERENTIAL EXISTS BETWEEN THE PRODUCTS OF COMBUSTION AND THE AMBIENT ATMOSPHERE, IF ANY. FOR INSULATED

PERMIT TO OPERATE

AREAS, THE EXTERNAL SURFACE AREA IS THE EXTERNAL SURFACE OF THE INSULATION. THE LEAK INSPECTION AREAS EXCLUDE AREAS OPERATING AT LESS THAN ATMOSPHERIC PRESSURE AND THOSE AREAS CONTROLLED WITH AN OPERATING SEALING AIR SYSTEM. IN ADDITION, AT LEAST ONCE EVERY TWO CALENDAR YEARS THE PERMITTEE SHALL CONDUCT A SURVEY OF THESE LEAK INSPECTION AREAS WITH INFRARED THERMOGRAPHY OR AN EQUIVALENT METHOD.
RULE(S):21, 69.

46.CON'T FROM CONDITION 27669
FOR EACH LEAK DISCOVERED IN THE LEAK INSPECTION AREA THAT HAS A VISIBLE LEAK AREA GREATER THAN 2.4 SQUARE FEET, THE PERMITTEE SHALL NOTIFY THE DISTRICT COMPLIANCE DIVISION WITHIN 2 HOURS OF THE DISCOVERY AND PROVIDE THE DISTRICT WITH THE APPROXIMATE DIMENSIONS AND LOCATION OF THE LEAK AND PROPOSED TIME FOR REPAIR. AT A MINIMUM, THE PERMITTEE SHALL REPAIR AS SOON AS PRACTICABLE ANY LEAKS DISCOVERED IN THE LEAK INSPECTION AREA LARGER THAN 1.3 SQUARE FEET AND ANY LEAKS NECESSARY TO MAINTAIN COMPLIANCE WITH RULE 69 EMISSION LIMITATIONS. THE PERMITTEE SHALL MAINTAIN A LOG THAT, FOR EACH LEAK REPAIRED, RECORDS: THE DATE OF DISCOVERY; A DESCRIPTION THAT INCLUDES THE LEAK'S MAXIMUM LENGTH AND WIDTH AS DETERMINED DURING THE REPAIR, THE LEAK'S LOCATION, AS DETERMINED DURING REPAIR; THE DATE REPAIR IS COMPLETED; AND THE NATURE OF THE REPAIR.
RULE(S):69, 21.

47.CON'T FROM CONDITION 27670
IN
ADDITION, THE PERMITTEE SHALL MAINTAIN A LOG THAT RECORDS THE DATE OF ANY MALFUNCTIONS, MAINTENANCE, AND REPAIR OF THE SEALING AIR SYSTEM. IN THE ABSENCE OF OTHER INFORMATION, A LEAK'S CROSS SECTIONAL FLOW AREA FOR DETERMINING LEAK RATE SHALL BE THE MAXIMUM LENGTH OF THE LEAK TIMES THE MAXIMUM WIDTH OF THE LEAK. NOTWITHSTANDING THE APPROVED PROTOCOL, EMISSIONS FROM LEAKS OF COMBUSTION PRODUCTS PRIOR TO TREATMENT IN THE SCR MAY BE CONSIDERED BY THE DISTRICT WHEN DETERMINING COMPLIANCE WITH ANY APPLICABLE EMISSION LIMIT.
RULE(S):21, 69.

48. THIS AIR POLLUTION CONTROL DISTRICT PERMIT DOES NOT RELIEVE THE HOLDER FROM OBTAINING PERMITS OR AUTHORIZATIONS REQUIRED BY OTHER GOVERNMENTAL AGENCIES.

49. THE PERMITTEE, SHALL UPON DETERMINATION OF APPLICABILITY AND WRITTEN NOTIFICATION BY THE DISTRICT, COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE AIR TOXICS 'HOT SPOTS'

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

CONTROL NO.
274867

PERMIT NO
001202
EXPIRES
MARCH 2007

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INFORMATION AND ASSESSMENT ACT (CALIFORNIA HEALTH AND SAFETY CODE SECTION 44300 ET.SEQ.).

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
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(858)586-2600 FAX(858)586-2601

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PERMIT NO
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THE FOLLOWING IS HEREBY GRANTED A PERMIT TO OPERATE THE ARTICLE,MACHINE,EQUIPMENT OR CONTRIVANCE DESCRIBED BELOW. THIS PERMIT IS NOT TRANSFERABLE TO A NEW OWNER NOR IS IT VALID FOR OPERATION OF THE EQUIPMENT AT ANOTHER LOCATION, EXCEPT AS SPECIFIED. THIS PERMIT TO OPERATE OR A COPY MUST BE POSTED ON OR WITHIN 25 FEET OF THE OF THE EQUIPMENT, OR READILY AVAILABLE, ON THE OPERATING PREMISES.

PERMITTEE
LSP SOUTH BAY LLC
JIM NYLANDER
990 BAY BL
CHULA VISTA CA 91911-1651

EQUIPMENT ADDRESS
LSP SOUTH BAY LLC
990 BAY BL
CHULA VISTA CA 91911-0000

EQUIPMENT DESCRIPTION REVISED COPY
GAS TURBINE/GENERATOR: PRATT & WHITNEY MOD GG-4-7 , 266MM BTU/HR INPUT, S/N 675120 JP-5 FIRED, WITH STEAM INJ; SOUTH BAY GT1

Sector#:17 ID#:00334A PO#:001276 BEC#:12574
Fee Schedules: 20G01 92G01

EVERY PERSON WHO OWNS OR OPERATES THIS EQUIPMENT IS REQUIRED TO COMPLY WITH THE CONDITIONS LISTED BELOW AND ALL APPLICABLE REQUIREMENTS AND DISTRICT RULES, INCLUDING BUT NOT LIMITED TO RULE(S) 53, 62, 69.3, 69.3.1, 40 CFR PART 64.

FAILURE TO OPERATE IN COMPLIANCE IS A MISDEMEANOR SUBJECT TO CIVIL AND CRIMINAL PENALTIES.

A. FEDERALLY-ENFORCEABLE AND DISTRICT-ENFORCEABLE CONDITIONS

1. THE PERMITTEE SHALL COMPLY WITH THE FOLLOWING APPLICABLE REQUIREMENTS: RULES 53, 62, 69.3, AND 40 CFR PART 64.
   RULE(S):1421.

2. THE PERMITTEE SHALL PERFORM A VISIBLE EMISSION INSPECTION AT LEAST ONCE EVERY 400 CUMULATIVE HOURS OF OPERATION ON LIQUID FUEL. FOR THE PURPOSES OF DETERMINING COMPLIANCE WITH THIS CONDITION, HOURS OF OPERATION SHALL BE ACCUMULATED OVER A FIVE (5) CALENDAR YEAR PERIOD. THE FIRST SUCH FIVE (5) YEAR PERIOD SHALL BEGIN ON JANUARY 1, 2003. HOWEVER, FOR THE 2003 CALENDAR YEAR, NO HOURS OF OPERATION SHALL BE ACCUMULATED BEFORE THE DATE THE INITIAL TITLE V PERMIT TO OPERATE IS ISSUED TO THIS FACILITY. THE PERMITTEE SHALL MAINTAIN RECORDS OF DATES AND RESULTS OF EACH VISIBLE EMISSION INSPECTION PERFORMED.
   RULE(S):1421.

3. IN THE EVENT THAT A VISIBLE EMISSION INSPECTION DETECTS ANY OPACITY IN THE EXHAUST OF THE TURBINE, WHEN OPERATING ON LIQUID FUEL, THE

file# 401.60.07

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PERMITTEE SHALL MEASURE EXHAUST OPACITY IN ACCORDANCE WITH EPA METHOD 9, "VISUAL DETERMINATION OF THE OPACITY OF EMISSIONS FROM STATIONARY SOURCES," WITHIN THREE (3) CALENDAR DAYS OF THE INSPECTION, OR, IF THE TURBINE CEASES OPERATING ON LIQUID FUEL WITHIN THREE (3) CALENDAR DAYS, THE EVALUATION SHALL BE PERFORMED DURING THE NEXT TIME THE TURBINE IS OPERATED ON LIQUID FUEL OR THE NEXT SCHEDULED TRAINING/TEST PERIOD WHEN LIQUID FUEL IS BURNED, WHICHEVER OCCURS FIRST. THE PERMITTEE SHALL MAINTAIN RECORDS OF THE DATES AND RESULTS OF ALL SUCH METHOD 9 EVALUATIONS.
RULE(S):1421.

4. THE EMISSION CONCENTRATION OF COMBUSTION PARTICULATES IN THE EXHAUST FROM THE TURBINE SHALL NOT EXCEED 0.1 GRAINS PER DRY STANDARD CUBIC FEET CORRECTED TO 12% CARBON DIOXIDE (CO2).
RULE(S):53.

5. AT THE REQUEST OF THE DISTRICT OR EPA, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH EPA METHOD 5, "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE REQUESTOR SHALL BE USED FOR THIS PURPOSE.
RULE(S):1421.

6. IN THE EVENT THAT THE TURBINE IS OPERATED ON LIQUID FUEL FOR MORE THAN 336 HOURS IN ANY CALENDAR YEAR, THE PERMITTEE SHALL PERFORM A MAINTENANCE INSPECTION BEFORE FEBRUARY 1 OF THE NEXT CALENDAR YEAR. DURING THIS INSPECTION, THE FOLLOWING SYSTEMS OR REPRESENTATIVE PORTIONS OF THOSE SYSTEMS SHALL BE CHECKED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS: (1) THE STEAM INJECTION SYSTEM; (2) THE BURNER NOZZLES FOR CLEANLINESS AND WARPING; AND (3) THE COMBUSTION CHAMBER FOR CLEANLINESS AND CRACKS. ANY NECESSARY MAINTENANCE INDICATED BY THE INSPECTION SHALL BE PERFORMED AND COMPLETED BY THE LATTER OF 30 CALENDAR DAYS AFTER THE INSPECTION OR THE NEXT TIME THE UNIT IS OPERATED ON LIQUID FUEL. THE PERMITTEE SHALL MAINTAIN RECORDS OF THE DATE EACH INPECTION WAS PERFORMED, THE RESULTS OF THE INSPECTION, AND THE DATE(S) AND NATURE OF ANY MAINTENANCE PERFORMED AS A RESULT OF THE INSPECTION.
RULE(S):1421.

7. ONLY LIQUID FUEL WITH A SULFUR CONTENT LESS THAN OR EQUAL TO 0.5% BY WEIGHT SHALL BE USED TO OPERATE THE EQUIPMENT DESCRIBED ABOVE. FOR ALL FUEL PURCHASED FOR USE IN THIS EQUIPMENT, THE

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PERMITTEE SHALL MAINTAIN RECORDS THAT IDENTIFY THE SUPPLIER OF THE LIQUID FUEL, INDICATE THE SULFUR CONTENTOF THE FUEL, AND THE TEST METHOD USED TO DETERMINE THE SULFUR CONTENT.
RULE(S):62, 1421.

8. AT THE REQUEST OF THE DISTRICT OR EPA, THE LIQUID FUEL IN EACH FUEL STORAGE TANK THAT SUPPLIES LIQUID FUEL TO THIS EQUIPMENT SHALL BE SAMPLED IN ACCORDANCE WITH ASTM D4057-88, "STANDARD PRACTICE FOR MANUAL SAMPLING OF PETROLEUM AND PETROLEUM PRODUCTS," AND ANALYZED FOR SULFUR CONTENT NO LATER THAN 30 CALENDAR DAYS OF BEING SAMPLED. THE SULFUR CONTENT OF ANY LIQUID FUEL SHALL BE MEASURED IN ACCORDANCE WITH ASTM D4294-90, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY ENERGY-DISPERSIVE X-RAY FLUORESCENCE SPECTROSCOPY," ASTM D2622-92, "STANDARD TEST METHOD FOR SULFUR IN PETROLEUM PRODUCTS BY X-RAY SPECTROMETRY," OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT AND EPA.
RULE(S):1421.

9. THE TURBINE DESCRIBED HEREIN SHALL NOT OPERATE FOR MORE THAN 876 HOURS IN EACH CALENDAR YEAR.
RULE(S):69.3.1.

10. THE ENGINE SHALL BE EQUIPPED WITH A NONRESETTABLE METER THAT MEASURES CUMMULATIVE ELAPSED OPERATING TIME.
RULE(S):21.

11. THE EMISSIONS CONCENTRATION OF OXIDES OF NITROGEN (NOX) EMISSIONS CALCULATED AS NITROGEN DIOXIDE (NO2) SHALL NOT EXCEED 42 PARTS PER MILLION BY VOLUME (PPMV), WHEN BURNING NATURAL GAS, AND 65 PPMV, WHEN BURNING LIQUID FUEL, MEASURED IN THE FLUE GAS AND CALCULATED AT 15% OXYGEN ON A DRY BASIS. EMISSION STANDARDS, SPECIFIED IN RULE 69.3(D) AND THIS CONDITION, SHALL NOT APPLY DURING STARTUP, SHUTDOWN OR FUEL CHANGE FOR A PERIOD NOT TO EXCEED 120 CONTINUOUS MINUTES.
RULE(S):69.3.

12. CONTINUOUS MONITORS ACCURATE TO PLUS OR MINUS 5% SHALL BE INSTALLED WHICH MONITOR THE STACK EXHAUST TEMPERATURE, MEGAWATTS PRODUCED AND THE RATE OF STEAM INJECTION. STRIP CHART RECORDERS SHALL BE INSTALLED TO RECORD THE OUTPUT FROM THE MEGAWATT PRODUCTION MONITOR AND THE OUTPUT FROM THE STEAM INJECTION MONITOR.
RULE(S):69.3, 40 CFR PART 64.

13. THE CONTINUOUS MONITORS AND RECORDERS SHALL BE MAINTAINED IN

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GOOD OPERATING CONDITION AND SHALL OPERATE AT ALL TIMES WHEN THE TURBINE IS IN OPERATION EXCEPT FOR THE PERIOD OF TIME BEGINNING WITH A STARTUP AND ENDING NO LATER THAN THE SOONER OF WHEN THE TURBINE GENERATOR IS ELECTRICALLY CONNECTED TO THE GRID OR 15 CONTINUOUS MINUTES FROM THE TIME OF STARTUP. THE PERMITTEE SHALL INSPECT AND CALIBRATE THE MONITOR AT LEAST ONCE EVERY CALENDAR YEAR TO MAINTAIN PLUS OR MINUS 5% ACCURACY. THE PERMITTEE SHALL MAINTAIN RECORDS OF THE INSPECTION, MAINTENANCE PERFORMED, AND CALIBRATION DATA.
RULE(S):21, 40 CFR PART 64.

14. THE STEAM FLOW WHEN THE TURBINE IS OPERATED SHALL BE WITHIN THE ENVELOPE DEFINED BY THE CHART TITLED "MEGAWATTS VS. STEAM FLOW, NOX ENVELOPE #1267" (1267 NOX ENVELOPE) THAT ILLUSTRATES THE RELATIONSHIP BETWEEN THE STEAM INJECTION FLOW RATES RANGE AND POWER OUTPUT NECESSARY FOR COMPLIANCE WITH THE NOX LIMITS OF THIS PERMIT AND THE RELATIONSHIP BETWEEN GAS OR LIQUID FUEL FLOW RATES AND POWER OUTPUT FROM THIS TURBINE.THE PERMITTEE SHALL MAINTAIN THIS CHART ONSITE AND MAKE IT AVAILABLE TO THE DISTRICT UPON REQUEST. IF THE STEAM FLOW RATE TO THE TURBINE IS OUTSIDE THE SPECIFIED ENVELOPE, THE PERMITTEE SHALL RESTORE STEAM FLOW RATE TO ITS NORMAL RANGE AS EXPEDITIOUSLY AS PRACTICAL. IF THE STEAM FLOW RATE TO THE TURBINE IS OUTSIDE THE SPECIFIED ENVELOPE FOR MORE THAN 5% OF THE OPERATING TIME IN ANY SIX CALENDAR MONTHS EXCLUDING STARTUP AND SHUTDOW PERIODS, THE PERMITTEE SHALL PLAN TO THE DISTRICT AS SPECIFIED IN 40 CFR PART 64 SECTION 64.8.
RULE(S):21, 1421, 40 CFR PART 64.

15. AN OPERATING LOG SHALL BE MAINTAINED AND MADE AVAILABLE TO THE DISTRICT UPON REQUEST. RECORDS IN THE LOG SHALL INCLUDE THE FOLLOWING: (1) HOURS OF OPERATION DURING EACH CALENDAR DAY; (2) TOTAL CUMULATIVE HOURS OF OPERATION DURING EACH CALENDAR YEAR (3) TOTAL CUMMULATIVE HOURS OF OPERATION ON LIQUID FUEL DURING EACH CALENDAR YEAR; (4) DATE AND CLOCK HOUR AND MINUTE OF EACH STARTUP; SHUTDOWN, AND FUEL CHANGE; (5) TYPE AND QUANTITY OF EACH FUEL USED DURING EACH CALENDAR YEAR; (6) THE TYPE OF FUEL USED DURING EACH PERIOD OF OPERATION OR PORTION THEREOF; ; AND (7) THE REASON FOR OPERATION (SOURCE TESTING, HIGH ELECTRICAL ENERGY DEMAND, MAINTENANCE, ETC). FOR THE PURPOSES OF COMPLIANCE, START UP COMMENCES WHEN FUEL FLOW TO THE TURBINE IS INTIATED AND A SHUTDOWN OCCURS WHEN FUEL CEASES TO FLOW TO THE TURBINE.
RULE(S):21, 69.3.

16. SOURCE TESTING TO MEASURE NOX EMISSIONS CONCENTRATION SHALL BE CONDUCTED IN ACCORDANCE WITH THE DISTRICT TEST METHOD 100, "TEST

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

CONTROL NO.
274868

PERMIT NO
001276
EXPIRES
MARCH 2007

PERMIT TO OPERATE

PROCEDURES FOR THE DETERMINATION OF NOX, CO, AND DILUENT GASES BY CONTINUOUS EMISSION MONITORING," DATED MAY 1995 OR WITH AIR RESOURCES BOARD (ARB), TEST METHOD 100, "PROCEDURES FOR CONTINUOUS GASEOUS EMISSION STACK SAMPLING," DATED JUNE 28, 1997, AS APPROVED BY EPA. ALTERNATIVE METHODS MAY BE USED WITH THE ADVANCED WRITTEN APPROVAL OF THE DISTRICT AND EPA. DURING EACH SOURCE TEST, AT LEAST THE FOLLOWING OPERATIONAL PARAMETERS SHALL BE MEASURED AND RECORDED IN ACCORDANCE WITH A SOURCE TEST PROTOCOL APROVED BY THE DISTRICT: GAS AND/OR LIQUID FUEL FLOW RATE, AS APPLICABLE; TURBINE POWER OUTPUT; STEAM INJECTION RATE; AND TURBINE EXHAUST TEMPERATURE.
RULE(S):69.3, 21.

17. SOURCE TESTING SHALL BE PERFORMED AT NO LESS THAN 80% OF THE POWER RATING. IF IT IS DEMONSTRATED TO THE SATISFACTION OF THE DISTRICT THAT THIS TURBINE CANNOT OPERATE AT THESE CONDITIONS, THEN EMISSIONS SOURCE TESTING SHALL BE PERFORMED AT THE HIGHEST ACHIEVABLE CONTINUOUS POWER RATING.
RULE(S):69.3.

18. SOURCE TESTING FOR NOX EMISSIONS CONCENTRATION SHALL BE PERFORMED AT LEAST ONCE EACH PERMIT YEAR. BEFORE THE DATE OF PERMIT RENEWAL. FOR PURPOSES OF THIS PERMIT, A PERMIT YEAR IS DEFINED AS THE 12-CALENDAR-MONTH PERIOD BEGINNING ON THE DATE OF PERMIT RENEWAL.
RULE(S):69.3.

19. FOR THE PURPOSES OF COMPLIANCE DETERMINATION BASED UPON SOURCE TESTING, THE NOX EMISSIONS CONCENTRATION SHALL BE CALCULATED AS THE AVERAGE OF THREE (3) SUBTESTS.
RULE(S):69.3.

B. DISTRICT-ONLY--ENFORCEABLE CONDITIONS

20. AT THE REQUEST OF THE DISTRICT, THE EXHAUST CONCENTRATION OF COMBUSTION PARTICULATES SHALL BE MEASURED IN ACCORDANCE WITH DISTRICT METHOD 5 "DETERMINATION OF PARTICULATE MATTER EMISSIONS FROM STATIONARY SOURCES" OR AN ALTERNATIVE METHOD THAT HAS BEEN APPROVED BY THE DISTRICT A SOURCE TEST PROTOCOL APPROVED IN WRITING IN ADVANCE BY THE DISTRICT SHALL BE USED FOR THIS PURPOSE.
RULE(S):53.

21. THIS AIR POLLUTION CONTROL DISTRICT PERMIT DOES NOT RELIEVE THE HOLDER FROM OBTAINING PERMITS OR AUTHORIZATIONS REQUIRED BY OTHER GOVERNMENTAL AGENCIES.

COUNTY OF SAN DIEGO, AIR POLLUTION CONTROL DISTRICT
10124 OLD GROVE ROAD, SAN DIEGO, CA 92131
(858)586-2600 FAX(858)586-2601

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PERMIT TO OPERATE

22. THE PERMITTEE, SHALL UPON DETERMINATION OF APPLICABILITY AND WRITTEN NOTIFICATION BY THE DISTRICT, COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE AIR TOXICS 'HOT SPOTS' INFORMATION AND ASSESSMENT ACT (CALIFORNIA HEALTH AND SAFETY CODE SECTION 44300 ET.SEQ.).

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Air Pollution Control Board

Greg Cox	District 1
Dianne Jacob	District 2
Pam Slater-Price	District 3
Ron Roberts	District 4
Bill Horn	District 5

August 22, 2006

JIM NYLANDER
LSP SOUTH BAY
990 BAY BLVD
CHULA VISTA CA 91911-1651

SOURCE TEST REPORT

A source test was recently performed at your facility. Enclosed is a copy of the source test report.

If you have any questions, please call me at (858) 586-2775.

SUZANNE BLACKBURN
Senior Air Pollution Control Chemist

SB:kb

Enclosures

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RENEWAL TESTING OF A BOILER AND CEMS RE-CERTIFICATION 2 Q 2006

San Diego Air Pollution Control District
Monitoring & Technical Services
10124 Old Grove Road, San Diego, CA 92131

APPROVED BY: Suzanne Blackburn, Senior Chemist, SDAPCD

TEST SITE: LSP SOUTH BAY
990 Bay Blvd.
Chula Vista, CA 91911

SITE ID#: 334A

EQUIPMENT: Boiler #1 – Babcock & Wilcox, 1550 MMBtu/hr input, Natural gas fired, SCR with ammonia injection and CEMS.

LIMITS: Rule 69. CEMS certified for SDAPCD Rule 69 and 40CFR75 Acid Rain Program. NOx: 0.15 lb/MW-hr (24 hr calendar day average). Ammonia slip: 12 ppm @ 3% O_2

PO NUMBER: 794

TEST DATE: June 21, 2006

TEST PERFORMED BY: APCD Source Test Team (Graham Mortimore, Larry Owusu, John Such, Suzanne Blackburn)

SUMMARY OF RESULTS:

The test data show the average NOx emissions to be 14.1 ppm @ 3% O_2, or 18.7 lb/hr, or 0.017 lb/MMBtu, or 0.161 lb/MW-hr. The average ammonia slip was 3.3 ppm @ 3% O_2. These meet the limits listed above. The average load during the test was 116 MW. All testing was performed while the unit was fired on Natural Gas with the SCR operating.

The source testing was performed as part of the annual 40CFR75 Acid Rain Program QA/QC Testing. The RATA test consisted of ten individual subtests. Run #2 was not used in the RATA calculations.

The old Oxygen CEMS analyzer was permanently replaced with a new like-kind Oxygen analyzer on June 14, 2006. The new analyzer is a Brand Gaus Model #4705, serial # 10441. This RATA serves as part of the re-certification for the new oxygen analyzer.

The CEMS on Unit #1 passed the RATA test. They are eligible for reduced RATA testing frequency (annual) because the average of the differences in NOx emission rate was 0.003 lb/MMBtu (it must be < 0.015 lb/MMBtu to qualify).

The CEMS has a Bias Adjustment factor (BAF) of 1.111 that will be applied to all NOx lb/MMBtu values from 6/21/06 at 1600, until the next RATA test.

The CEMS also passed the NOx lb/MW-hr RATA (40CFR60). The RATA results were 18.3%, which is less than the required 20%.

The Boiler Unit #1 at LSP South Bay is in compliance with APCD Rule 69, in addition to 40CFR60 and 40CFR75 CEMS certification requirements.

Attachment: Table of Test Results.

NOTE: RM stands for Reference Method (the source test van results).
CEMS stands for the printout from the LSP CEM system.

LSP South Bay Unit #1

Relative Accuracy Determination

NOx in lb/MMBtu

Run No.	Date	Time		Load MW	Reference lb/MMBtu	CEMS Avg lb/MMBtu	Difference lb/MMbtu
1	6/21/06	07:11 -	08:03	116	0.018	0.015	0.003
2	6/21/06	08:43 -	09:13	116	0.022	0.016	0.006
3	6/21/06	09:34 -	10:04	116	0.017	0.015	0.002
4	6/21/06	10:15 -	10:45	116	0.019	0.015	0.004
5	6/21/06	11:00 -	11:30	116	0.018	0.016	0.002
6	6/21/06	11:45 -	12:15	116	0.017	0.015	0.002
7	6/21/06	12:30 -	13:00	116	0.018	0.016	0.002
8	6/21/06	13:16 -	13:46	116	0.016	0.012	0.004
9	6/21/06	14:00 -	14:30	116	0.017	0.014	0.003
10	6/21/06	14:45 -	15:15	116	0.014	0.012	0.002
			Average	116	0.017	0.014	0.003

Standard Deviation 0.001

Confidence Coefficient 0.001

Average Differences 0.003 **PASS RATA**

Relative Accuracy 19.5 % [redacted]

Bias Test FAIL BIAS

pass if average of differences < confidence coefficient

Bias Adjustment Factor 1.185 Max = 1.111

Note: Run 2 was not used in the RATA calculations

RELATIVE ACCURACY TEST AUDIT

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Monitoring and Technical Services
10124 Old Grove Road
San Diego, CA 92131

Nitrogen Oxides & Ammonia Emissions Summary Report

SITE: **LSP South Bay LLC, Unit #1**
LOCATION: 990 Bay Blvd.
Chula Vista, CA 91911

Mail Address: LSP South Bay LLC, Unit #1
990 Bay Blvd.
Chula Vista, CA 91911
Attn. Jim Nylander

P/O NUMBER: 794
ID #: 334 A
TEST DATE: 21-Jun-06
EQUIPMENT: Babcock & Wilcox utility boiler, 1550 MMBtu/hr input, residual oil and/or natural gas fire. Graseby/STI CEM system & associated software. One Babcock & Wilcox in-duct plate selective catalytic reduction system. Associated ammonia injection system and evaporation skid. Monitoring equipment and ancilliary equipment. Boiler has water and steam injection capability

REPORT BY: G.R.Mortimore
DATE: 5-Jul-06

APCD PERSONNEL: S.Blackburn, G.R.Mortimore, J.Such, L.Owusu.

SITE PERSONNEL: Jim Nylander

APPROVED BY: Suzanne Blackburn, Senior Chemist

Table 1. Summary of Results- NOx & NH3.

	TEST	PERMIT LIMITS	PERFORMANCE	HOURS OF TEST
NOx ppm @ 3% O2	**14.48**	**N/A**	**information only**	**5.0**
NH3 ppm @ 3% O2	**3.34**	**12**	**PASS**	**1.5**
Gross MW	**116**			
Fuel	**Natural gas @ 10,753 kscfh**			

TEST REFERENCE: This testing was performed in accordance with the San Diego Air Pollution Control District Method 100: "Test Procedures For The Determination of Nitrogen Oxides, Carbon Monoxide and Diluent Gases by Continuous Emission Monitoring." Ammonia determination was by Bay Area Methods ST-1A, ST-1B.

GRM, 27-Feb-03, v 4.0

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Air Pollution Control Board

Greg Cox	District 1
Dianne Jacob	District 2
Pam Slater-Price	District 3
Ron Roberts	District 4
Bill Horn	District 5

September 25, 2006

JIM NYLANDER
LSP SOUTH BAY
990 BAY BLVD
CHULA VISTA CA 91911-1651

SOURCE TEST REPORT

A source test was recently performed at your facility. Enclosed is a copy of the source test report.

If you have any questions, please call me at (858) 586-2775.

SUZANNE BLACKBURN
Senior Air Pollution Control Chemist

SB:kb

Enclosures

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RENEWAL TESTING OF A BOILER AND CEMS RE-CERTIFICATION 3 Q 2006

San Diego Air Pollution Control District
Monitoring & Technical Services
10124 Old Grove Road, San Diego, CA 92131

APPROVED BY: Suzanne Blackburn, Senior Chemist, SDAPCD

TEST SITE: LSP SOUTH BAY
990 Bay Blvd.
Chula Vista, CA 91911

SITE ID#: 334A

EQUIPMENT: Boiler #2 – Babcock & Wilcox, 1510 MMBtu/hr input, Natural gas fired, SCR with ammonia injection and CEMS. 156 MW Gross.

LIMITS: Rule 69. CEMS certified for SDAPCD Rule 69 and 40CFR75 Acid Rain Program. NOx: 0.15 lb/MW-hr (24 hr calendar day average).
Ammonia slip: 12 ppm @ 3% O_2

PO NUMBER: 795

TEST DATE: August 8, 2006

TEST PERFORMED BY: APCD Source Test Team (Graham Mortimore, Sterling Ross, John Such, Suzanne Blackburn)

SUMMARY OF RESULTS:

The test data show the average NOx emissions to be 12.2 ppm @ 3% O_2, or 15.5 lb/hr, or 0.015 lb/MMBtu, or 0.145 lb/MW-hr. The average ammonia slip was 2.0 ppm @ 3% O_2. These meet the limits listed above. The average load during the test was 107 MW. All testing was performed while the unit was fired on Natural Gas with the SCR operating.

The source testing was performed as part of the annual 40CFR75 Acid Rain Program QA/QC Testing. The RATA test consisted of nine individual subtests.

The old Oxygen CEMS analyzer was permanently replaced with a new like-kind Oxygen analyzer on June 29, 2006. The new analyzer is a Brand Gaus Model #4705, serial # 10442. This RATA serves as part of the re-certification for the new oxygen analyzer. The new Oxygen analyzer passed RATA at 1%.

The CEMS on Unit #2 passed the RATA test. They are eligible for reduced RATA testing frequency (annual) because their results were 5.8% (less than 7.5%)

The CEMS has a Bias Adjustment factor (BAF) of 1.031 that will be applied to all NOx lb/MMBtu values from 8/8/06 at 1800, until the next RATA test.

The CEMS also passed the NOx lb/MW-hr RATA (40CFR60). The RATA results were 4.4%, which is less than 20%.

The Boiler Unit #2 at LSP South Bay is in compliance with 40CFR60 and 40CFR75 CEMS certification requirements.

Attachment: Table of Test Results.

NOTE: RM stands for Reference Method (the source test van results).
CEMS stands for the printout from the LSP CEM system.

LSP South Bay Unit #2

Relative Accuracy Determination

NOx in lb/MMBtu

Run No.	Date	Time		Load MW	Reference lb/MMBtu	CEMS Avg lb/MMBtu	Difference lb/MMbtu
1	8/8/06	10:44 -	11:18	107	0.015	0.014	0.001
2	8/8/06	12:03 -	12:33	107	0.015	0.015	0.000
3	8/8/06	12:45 -	13:15	107	0.015	0.015	0.000
4	8/8/06	13:30 -	14:00	107	0.016	0.015	0.001
5	8/8/06	14:15 -	14:45	107	0.016	0.015	0.001
6	8/8/06	15:01 -	15:31	107	0.015	0.014	0.001
7	8/8/06	15:45 -	16:15	107	0.014	0.014	0.000
8	8/8/06	16:30 -	17:00	107	0.014	0.014	0.000
9	8/8/06	17:15 -	17:45	108	0.013	0.013	0.000
			Average	107	0.015	0.014	0.000

Standard Deviation 0.001

Confidence Coefficient 0.000

Average Differences **0.000** PASS RATA

Relative Accuracy **5.75 %** PASS RATA

Bias Test **FAIL BIAS**

pass if average of differences < confidence coefficient

Bias Adjustment Factor **1.031**

RELATIVE ACCURACY TEST AUDIT

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Monitoring and Technical Services
10124 Old Grove Road
San Diego, CA 92131

Nitrogen Oxides & Ammonia Emissions Summary Report

SITE: **LSP South Bay, Boiler #2**
LOCATION: 990 Bay Blvd.
Chula Vista, CA 91911

Mail Address: LSP South Bay
990 Bay Blvd.
Chula Vista, CA 91911
Attn. Jim Nylander

P/O NUMBER: 795
ID #: 334 A
TEST DATE: 8-Aug-06
EQUIPMENT: Babcok & Wilcox utility boiler, 1510 MMBtu/hr, residual oil and/or natural gas fired. Graseby/STI CEMS system and associated software. In duct plate SCR system using aqueous ammonia, associated ammonia injection control and monitoring equipment.

REPORT BY: G.R.Mortimore
DATE: 16-Aug-06

APCD PERSONNEL: S.Blackburn, G.R.Mortimore, J.Such, S.Ross

SITE PERSONNEL: Jim Nylander

APPROVED BY: Suzanne Blackburn, Senior Chemist

Table 1. Summary of Results- NOx & NH3.

	TEST	PERMIT LIMITS	PERFORMANCE	HOURS OF TEST
NOx (ppm @ 3% O2)	**12.2**	**N/A**	**information only**	**4.5**
NH3 (ppm @ 3% O2)	**1.97**	**12**	**PASS**	**1.5**
GROSS MW	**107**			
Fuel	**Natural gas @ 10,193 kscfh**			

TEST REFERENCE: This testing was performed in accordance with the San Diego Air Pollution Control District Method 100: "Test Procedures For The Determination of Nitrogen Oxides, Carbon Monoxide and Diluent Gases by Continuous Emission Monitoring."
NOx determination was by EPA Method 7E
Ammonia determination was by Bay Area Methods ST-1A, ST-1B.

GRM, 27-Feb-03, v 4.0

RENEWAL TESTING OF A BOILER AND CEMS RE-CERTIFICATION 3 Q 2006

San Diego Air Pollution Control District
Monitoring & Technical Services
10124 Old Grove Road, San Diego, CA 92131

APPROVED BY: Suzanne Blackburn, Senior Chemist, SDAPCD

TEST SITE: LSP SOUTH BAY
990 Bay Blvd.
Chula Vista, CA 91911

SITE ID#: 334A

EQUIPMENT: Boiler #3 – Riley Stocker, 2,145 MMBtu/hr input, Natural gas fired, SCR with ammonia injection and CEMS. 183 MW Gross.

LIMITS: Rule 69. CEMS certified for SDAPCD Rule 69 and 40CFR75 Acid Rain Program. NOx: 0.15 lb/MW-hr (24 hr calendar day average). Ammonia slip: 10.5 ppm @ 3% O_2

PO NUMBER: 1201

TEST DATE: August 9, 2006

TEST PERFORMED BY: APCD Source Test Team (Graham Mortimore, Sterling Ross, John Such, Suzanne Blackburn)

SUMMARY OF RESULTS:

The test data show the average NOx emissions to be 11.3 ppm @ 3% O_2, or 18.9 lb/hr, or 0.014 lb/MMBtu, or 0.140 lb/MW-hr. The average ammonia slip was 3.0 ppm @ 3% O_2. These meet the limits requirements listed above. The average load during the test was 135 MW. All testing was performed while the unit was fired on Natural Gas with the SCR operating.

The source testing was performed as part of the annual 40CFR75 Acid Rain Program QA/QC Testing. The RATA test consisted of nine individual subtests.

The old Oxygen CEMS analyzer was permanently replaced with a new like-kind Oxygen analyzer on July 21, 2006. The new analyzer is a Brand Gaus Model #4705, serial # 10443. This RATA serves as part of the re-certification for the new oxygen analyzer. The new Oxygen analyzer passed RATA at 5.9%.

The CEMS on Unit #3 passed the RATA test. They are eligible for reduced RATA testing frequency (annual) because the average of the differences was 0.000 (less than $\pm$ 0.015). There was no Bias Adjustment factor.

The CEMS also passed the NOx lb/MW-hr RATA (40CFR60). The RATA results were 10.4%, which is less than 20%.

The Boiler Unit #3 at LSP South Bay is in compliance with 40CFR60 and 40CFR75 CEMS certification requirements.

Attachment: Table of Test Results.

NOTE: RM stands for Reference Method (the source test van results).
CEMS stands for the printout from the LSP CEM system.

LSP South Bay Unit #3

Relative Accuracy Determination

NOx in lb/MMBtu

Run No.	Date	Time		Load MW	Reference lb/MMBtu	CEMS Avg lb/MMBtu	Difference lb/MMbtu
1	8/9/06	07:45 -	08:37	135	0.013	0.013	0.000
2	8/9/06	09:00 -	09:30	135	0.014	0.014	0.000
3	8/9/06	09:45 -	10:15	135	0.016	0.014	0.002
4	8/9/06	10:30 -	11:00	135	0.015	0.013	0.002
5	8/9/06	11:16 -	11:46	135	0.014	0.013	0.001
6	8/9/06	12:00 -	12:30	135	0.012	0.012	0.000
7	8/9/06	12:45 -	13:15	135	0.010	0.013	-0.003
8	8/9/06	13:30 -	14:00	135	0.014	0.013	0.001
9	8/9/06	14:15 -	14:45	135	0.015	0.015	0.000
			Average	135	0.014	0.013	0.000

Standard Deviation 0.002

Confidence Coefficient 0.001

Average Differences **0.000** PASS RATA

Relative Accuracy **10.9 %**

Bias Test **PASS**

pass if average of differences < confidence coefficient

Bias Adjustment Factor **1.000**

RELATIVE ACCURACY TEST AUDIT

AIR POLLUTION CONTROL DISTRICT

COUNTY OF SAN DIEGO

Monitoring and Technical Services
10124 Old Grove Road
San Diego, CA 92131

Nitrogen Oxides & Ammonia Emissions Summary Report

SITE: **LSP South Bay, Boiler #3**

LOCATION: 990 Bay Blvd.
Chula Vista, CA 91911

Mail Address: LSP South Bay
990 Bay Blvd.
Chula Vista, CA 91911
Attn. Jim Nylander

P/O NUMBER: 1201
ID #: 334 A
EQUIPMENT:

TEST DATE: 9-Aug-06

Riley Stocker utility boiler, 2145 MMBtu/hr input, s/n 23003-64, residual oil and/or natural gas fired. Graseby/STI CEMS system and associated software. In duct plate SCR system using aqueous ammonia, associated ammonia injection control and monitoring equipment.

REPORT BY: G.R.Mortimore

DATE: 17-Aug-06

APCD PERSONNEL: S.Blackburn, G.R.Mortimore, S.Ross, J.Such

SITE PERSONNEL: Jim Nylander

APPROVED BY: Suzanne Blackburn, Senior Chemist

Table 1. Summary of Results- NOx & NH3

	TEST	PERMIT LIMITS	PERFORMANCE	HOURS OF TEST
NOx (ppm @ 3% O2)	**11.34**	**N/A**	**information only**	**4.5**
NH3 (ppm @ 3% O2)	**2.95**	**10.5**	**PASS**	**1.5**
GROSS MW	**135**			
Fuel	**Natural gas @ 13,526 kscfh**			

TEST REFERENCE: This testing was performed in accordance with the San Diego Air Pollution Control District Method 100: "Test Procedures For The Determination of Nitrogen Oxides, Carbon Monoxide and Diluent Gases by Continuous Emission Monitoring."
NOx determination was by EPA Method 7E
Ammonia determination was by Bay Area Methods ST-1A, ST-1B.

RENEWAL TESTING OF A BOILER AND CEMS RE-CERTIFICATION 3 Q 2006

San Diego Air Pollution Control District
Monitoring & Technical Services
10124 Old Grove Road, San Diego, CA 92131

APPROVED BY: Suzanne Blackburn, Senior Chemist, SDAPCD

TEST SITE: LSP SOUTH BAY
990 Bay Blvd.
Chula Vista, CA 91911

SITE ID#: 334A

EQUIPMENT: Boiler #4 – Combustion Eng., 2900 MMBtu/hr input, SCR and CEMS. 232 MW Gross.

LIMITS: Rule 69. CEMS certified for SDAPCD Rule 69 and 40CFR75 Acid Rain Program. NOx: 0.15 lb/MW-hr (24 hr calendar day average). Ammonia slip: 10 ppm @ 3% O_2

PO NUMBER: 1202

TEST DATE: August 11, 2006

TEST PERFORMED BY: APCD Source Test Team (Graham Mortimore, Ian Morris, John Such, Suzanne Blackburn)

SUMMARY OF RESULTS:

The test data show the average NOx emissions to be 6.8 ppm @ 3% O_2 dry basis, or 15.4 lb/hr, or 0.008 lb/MMBtu, or 0.095 lb/MW-hr. The average ammonia slip was 0.6 ppm @ 3% O_2. These meet the limits listed above. The average load during the test was 162 MW. All testing was performed while the unit was fired on Natural Gas with the SCR operating.

The source testing was performed as part of the annual 40CFR75 Acid Rain Program QA/QC Testing. The RATA test consisted of nine individual subtests.

The old Oxygen CEMS analyzer was permanently replaced with a new like-kind Oxygen analyzer on August 8, 2006. The new analyzer is a Brand Gaus Model #4705, serial # 10444. This RATA serves as part of the re-certification for the new oxygen analyzer. The new Oxygen analyzer passed RATA with a difference of -0.89% O2 (less than 1% O2).

The CEMS on Unit #4 passed the RATA test. They are eligible for reduced RATA testing frequency (annual) because the difference was -0.002 (less than $\pm$ 0.015). There was no Bias Adjustment Factor.

The Boiler Unit #4 at LSP South Bay is in compliance with 40CFR75 CEMS certification requirements.

Attachment: Table of Test Results.

NOTE: RM stands for Reference Method (the source test van results).
CEMS stands for the printout from the LSP CEM system.

LSP South Bay Unit #4

Relative Accuracy Determination

NOx in lb/MMBtu

Run No.	Date	Time		Load MW	Reference lb/MMBtu	CEMS Avg lb/MMBtu	Difference lb/MMbtu
1	8/11/06	07:16 -	08:19	162	0.012	0.013	-0.001
2	8/11/06	08:48 -	09:43	162	0.005	0.007	-0.002
3	8/11/06	10:25 -	11:18	162	0.007	0.009	-0.002
4	8/11/06	11:39 -	12:31	162	0.006	0.007	-0.001
5	8/11/06	12:47 -	13:40	162	0.010	0.011	-0.001
6	8/11/06	13:53 -	14:44	162	0.010	0.011	-0.001
7	8/11/06	14:59 -	15:47	162	0.006	0.009	-0.003
8	8/11/06	15:57 -	16:47	162	0.005	0.009	-0.004
9	8/11/06	16:55 -	17:44	162	0.012	0.014	-0.002
			Average	162	0.008	0.010	-0.002

Standard Deviation 0.001

Confidence Coefficient 0.001

Average Differences **-0.002** **PASS RATA**

Relative Accuracy **33.3 %**

Bias Test **NO BAF**

pass if average of differences < confidence coefficient

Bias Adjustment Factor **1.000**

RELATIVE ACCURACY TEST AUDIT

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Monitoring and Technical Services
10124 Old Grove Road
San Diego, CA 92131

Nitrogen Oxides & Ammonia Emissions Summary Report

SITE: **LSP South Bay, Boiler #4**
LOCATION: 990 Bay Blvd.
Chula Vista, CA 91911

Mail Address: LSP South Bay
990 Bay Blvd.
Chula Vista, CA 91911
Attn. Jim Nylander

P/O NUMBER: 1202
ID #: 334 A
EQUIPMENT:

TEST DATE: 11-Aug-06

Boiler #4, combustion eng., 2900 MMBtu/hr input, s/n 22607-72, residual oil &/or gas fired with water injection and steam injection capability, Graseby/STI continuous emissions monitoring system & associated software.

REPORT BY: G.R.Mortimore

DATE: 17-Aug-06

APCD PERSONNEL: S.Blackburn, G.R.Mortimore, I.Morris, J.Such

SITE PERSONNEL: Jim Nylander

APPROVED BY:
Suzanne Blackburn, Senior Chemist

Table 1. Summary of Results- NOx & NH3

	TEST	PERMIT LIMITS	PERFORMANCE	HOURS OF TEST
NOx (ppm @ 3% O2)	**6.76**	**N/A**	**information only**	**7.5**
NH3 (ppm @ 3% O2)	**0.56**	**10**	**PASS**	**1.5**
GROSS MW	**162**			
Fuel	**Natural gas @ 18,461 kscfh**			

TEST REFERENCE: This testing was performed in accordance with the San Diego Air Pollution Control District Method 100: "Test Procedures For The Determination of Nitrogen Oxides, Carbon Monoxide and Diluent Gases by Continuous Emission Monitoring."
NOx determination was by EPA Method 7E
Ammonia determination was by Bay Area Methods ST-1A, ST-1B.

GRM, 27-Feb-03, v 4.0

401.35.05
CT - 2006,
8/29/06

19

RENEWAL TEST
(For Permit Year: Mar. 2006-Mar. 2007)

AIR POLLUTION CONTROL DISTRICT
COUNTY OF SAN DIEGO

Monitoring and Technical Services
10124 Old Grove Road
San Diego, CA 92131

Nitrogen Oxides Emissions Summary Report

SITE: **LSP, South Bay LLC**
Gas Turbine
LOCATION: 990 Bay Blvd, SD 1200
Chula Vista, CA 91911.

MAIL ADDRESS: LSP, South Bay LLC
990 Bay Blvd, SD 1200
Chula Vista, CA 91911.

P/O NUMBER: 1276
ID NUMBER: 334 A

TEST DATE: 29-Aug-06

EQUIPMENT: Gas turbine/generator: Pratt & Whitney model GG-4-7, 266 MMBtu/hr input, s/n 675120, JP-5 fired with steam injection.

REPORT BY: G.R.Mortimore

DATE: 29-Aug-06

APCD PERSONNEL: G.R.Mortimore, L.Kear-Padilla

SITE PERSONNEL: Jim Nylander

APPROVED BY: Suzanne Blackburn, Senior Chemist

Table 1. Summary of Results- NOx stack emissions corrected to 15% O2.

	TEST	PERMIT LIMITS	PERFORMANCE	HOURS OF TEST
NOx (ppm)	**41**	**65**	**PASS**	**1.5**
Fuel	**JP-5 (no fuel flow figures available)**			
Generator output (MW)	**14.8, rated @ 15**			

TEST REFERENCE: This testing was performed in accordance with the San Diego Air Pollution Control District Method 100: "Test Procedures For The Determination of Nitrogen Oxides, Carbon Monoxide and Diluent Gases by Continuous Emission Monitoring."

1

SOUTH BAY UNIT 1

SELECTIVE CATALYTIC REDUCTION SYSTEM

PERFORMANCE TEST

Prepared for

San Diego Gas & Electric
San Diego, California

Prepared by

M. D. McDannel, P.E.
G. C. Quartucy, P.E.

Fossil Energy Research Corporation
Laguna Hills, California

June 1997

FOSSIL ENERGY RESEARCH CORP.

23342 C SOUTH POINTE, LAGUNA HILLS, CA 92653

1

INTRODUCTION

Fossil Energy Research Corporation (FERCo) and Delta Air Quality Services (Delta) were contracted by San Diego Gas & Electric (SDG&E) to perform the initial air permit and warranty testing on the new selective catalytic reduction (SCR) system at SDG&E's South Bay Unit 1. Tests were performed from April 29 through May 7, 1997, on natural gas and residual fuel oil, and at maximum and minimum unit loads.

This report presents the results of the SCR performance test conducted to determine compliance with warranty conditions agreed upon between SDG&E and Babcock & Wilcox (B&W), the supplier of the SCR system.

Testing was supervised by Mr. Mark McDannel of FERCo. FERCo crew members were Greg Quartucy, Paul Anderson, Tom Martz, and Tom Fang. Delta served as a subcontractor to FERCo. Delta crew members included Bob Finken, Arlene Bell, Stafford Pease, Jim Ritchey, and Chris Hone. Jim Nylander, Ellis Jones, and Kent Miles coordinated the tests for SDG&E, and Rich Blagg of Raytheon was responsible for collection of unit data. Mr. Don Tonn of B&W was also on site to witness the tests.

The results of the tests performed to demonstrate warranty compliance are summarized in Table 1, and compared directly with guarantee items for the four test conditions in Tables 2 through 5. The tables show that all guarantee emission levels were met. The increase in measured CO across the catalyst at full load on gas fuel is attributed to the impact of flue gas stratification on the measurements, and not to the SCR system.

Table 1

SOUTH BAY 1 SCR PERFORMANCE TEST - RESULTS SUMMARY

Test Day	1	2	3	4	5	6
Date, 1997	29-Apr	30-Apr	1-May	2-May	5-May	6-May
Start Time	11:15	8:50	9:00	8:00	8:12	20:35
End Time	1:33	21:30	18:31	17:40	17:33	7:00
Fuel	Oil	Oil	Oil	Gas	Gas	Oil
Load, MW gross (1)	147	33	147	147	33	33
NOx, ppmc (2)						
Stack	-	-	29.9	14.0	10.5	22.4
O2, % dry						
Inlet						
Stack	4.68	10.65	5.00	3.13	8.04	10.2
Flow rate, wet Nm3/hr						
Inlet, stack based	-	-	431,974	430,340	135,495	150,049
Inlet, fuel based	-	-	400,478	407,339	131,957	126,749
Flow rate, dscfm						
Inlet, stack based	-	-	238,500	216,122	72,070	87,015
Inlet, fuel based	-	-	226,109	210,383	71,628	74,635
Stack, as measured	276,600	120,900	270,900	244,900	85,200	108,200
Stack, fuel based	-	-	256,825	238,442	84,717	92,841
SO2, ppmc						
Inlet	-	-	120	-	-	123
Outlet	-	-	120	-	-	125
CO, ppmc						
Inlet	-	-	<5	199	<5	<5
Outlet	-	-	<5	246	<5	<5
Static pressure, iwg						
Inlet	-	-	6.33	5.25	0.4	0.7
Outlet	-	-	4.25	3.8	0.3	0.2
NH3, ppmc						
Stack	-	-	1.0	9.6	5.4	0.4
HC, ppm						
Inlet	-	-	7	11	11	2
Outlet	-	-	<2	<2	<2	<2
Opacity, %	0.4	0.8	0	0	0.5	0.6
Non H2SO4 PM10, SCR off						
gr/dscf at 12% CO2	0.0039	0.0056	-	-	-	-
lb/hr	9.47	3.71	-	-	-	-
Non H2SO4 PM10, SCR on						
gr/dscf at 12% CO2	0.0048	0.0052	-	-	-	-
lb/hr	12.5	3.45	-	-	-	-

(1) Watt-hour measurement, gross
(2) parts per million corrected to 3% O2, dry

Table 2

SOUTH BAY 1 SCR PERFORMANCE TEST
CASE 1: OIL FIRING AT 33 MW (1)

Guarantee Item	*Contract Guarantee*	*Test Results*	*Pass/Fail*
Inlet NOx Concentration, ppmvd at 3% O2 As measured	129	174	-
NOx Concentration, ppmvd at 3% O2 As measured	27.6 (2)	22.4	Pass
NH3 Slip Concentration, ppmvd at 3% O2 As measured	2	0.4	Pass
Pressure Drop, iwg	3	0.5	Pass
CO Concentration Increase, ppmvd	0	0	Pass
VOC Concentration Increase, ppmvd	0	< 0	Pass
SO2 Concentration Increase, ppmvd at 3% O2 (3)	0	0	Pass
Non H2SO4 PM10 Increase, lb/hr	5.2	< 0	Pass
Opacity, %	10	0.6	Pass
NH3 Consumption, lb/hr	72 (2)	89	(4)
O2 Concentration, % dry	-	10.2	-
Auxiliary Power Requirements, kW	55	< 29.4	Pass

Notes:

1. Low load test results are not corrected for deviations from contract design conditions (design conditions are for full load).
2. Based on straight line interpolation of guarantee curve
3. SO2 comparison based on inlet vs. outlet data, not on stack data.
4. Pass/Fail determination made separately by SDG&E

Table 3

SOUTH BAY 1 SCR PERFORMANCE TEST
CASE 2: OIL FIRING AT 147 MW

Guarantee Item	*Contract Guarantee*	*Test Results*	*Pass/Fail*
Inlet NOx Concentration, ppmvd at 3% O2			
As measured	225	222	-
NOx Concentration, ppmvd at 3% O2			
As measured	-	29.9	-
Curve corrected	33	32.7	Pass
NH3 Slip Concentration, ppmvd at 3% O2			
As measured	-	1.0	-
Curve corrected	2	0.8	Pass
Pressure Drop, iwg	3	1.9	Pass
CO Concentration Increase, ppmvd	0	0	Pass
VOC Concentration Increase, ppmvd	0	< 0	Pass
SO2 Concentration Increase, ppmvd at 3% O2 (1)	0	0	Pass
Non H2SO4 PM10 Increase, lb/hr	5.2	3.0	Pass
Opacity, %	10	0.1	Pass
NH3 Consumption, lb/hr	456	441	(2)
O2 Concentration, % dry	-	5.0	-
Auxiliary Power Requirements, kW	55	29.4	Pass

Notes:

1. SO2 comparison based on inlet vs. outlet data, not on stack data.
2. Pass/Fail determination made separately by SDG&E

Table 4

SOUTH BAY 1 SCR PERFORMANCE TEST
CASE 3: GAS FIRING AT 33 MW (1)

Guarantee Item	*Contract Guarantee*	*Test Results*	*Pass/Fail*
Inlet NOx Concentration, ppmvd at 3% O2 As measured	86	135	-
NOx Concentration, ppmvd at 3% O2 As measured	12.5	10.5	Pass
NH3 Slip Concentration, ppmvd at 3% O2 As measured	10	5.4	Pass
Pressure Drop, iwg	3	0.1	Pass
CO Concentration Increase, ppmvd	0	0	Pass
VOC Concentration Increase, ppmvd	0	< 0	Pass
Opacity, %	5	0.5	Pass
NH3 Consumption, lb/hr	50.5 (2)	63.6	(3)
O2 Concentration, % dry	-	8.0	-
Auxiliary Power Requirements, kW	55	< 29.4	Pass

Notes:

1. Low load test results are not corrected for deviations from contract design conditions (design conditions are for full load).
2. Based on straight line interpolation of guarantee curve

Table 5

SOUTH BAY 1 SCR PERFORMANCE TEST
CASE 4: GAS FIRING AT 147 MW

Guarantee Item	*Contract Guarantee*	*Test Results*	*Pass/Fail*
Inlet NOx Concentration, ppmvd at 3% O2, As measured	150	167	-
NOx Concentration, ppmvd at 3% O2			
As measured	-	14.0	-
Curve corrected	15	14.2	Pass
NH3 Slip Concentration, ppmvd at 3% O2			
As measured	-	9.6	-
Curve corrected	10	9.0	Pass
Pressure Drop, iwg	3	1.5	Pass
CO Concentration Increase, ppmvd	0	47	Pass (1)
VOC Concentration Increase, ppmvd	0	< 0	Pass
Opacity, %	5	0	Pass
NH3 Consumption, lb/hr	324	383.4	(2)
O2 Concentration, % dry	-	3.1	-
Auxiliary Power Requirements, kW	55	29.4	Pass

Notes:

1. Inlet CO increased above normal operating concentrations in an attempt to match other contract variables. This increase is considered an artifact of testing.
2. Pass/Fail determination made separately by SDG&E

Ammonia consumption (in lb/hr) measured by the plant ammonia flow meter exceeded guarantee levels for three of the four conditions. Pass/fail determinations of ammonia flow rate were made separately by SDG&E.

Section 2 of this report includes a description of the unit and its operation during the test program; Section 3 contains descriptions of test methods and equipment; detailed results are presented in Section 4. The Appendices include calculations, raw data sheets, and quality assurance information.

3 A

4

RESULTS

This section presents program results relevant to demonstration of guarantee status. Gaseous emissions are presented in Section 4.1, ammonia measurements are in Section 4.2, and particulate results are in Section 4.3. Discussions on compliance with individual guarantee limits are presented in each section. Correction of NO_x and NH_3 measurements according to the correction curves provided by B&W are presented in Section 4.4. Note that comparison of measurements with guarantee conditions was summarized earlier in Tables 2 through 5 of Section 1.

Notes on test numbering. A consistent test numbering system was used for all samples collected by FERCo and Delta. Each individual run number consisted of four identifiers as follows:

Test number/replicate number-test type-sample location

There were six test numbers assigned (Tests 1 through 6), one for each test day/ condition. The replicate numbers were assigned letters A through E, and represented individual replicates for each type of test. For example, Test Number 4B-NH_3-Stack is the second ammonia test at the stack on Test Day 4. Note that similarly identified replicates are not necessarily simultaneous; i.e., Run 4B-CEM-Stack was not necessarily taken at the same time as 4B-NH_3-Stack.

Two hydrocarbon tests were conducted on different days than the other similarly numbered tests. For these tests, the number of the test condition is used rather than the test number of the date on which the samples were collected.

8.B

4.1 Gaseous Emissions Measurements

The results of the stack gaseous emissions measurements are presented in Table 9. Inlet and outlet SO_2, CO, and HC measurements are presented in Table 10. As required under the test plan, three replicates were conducted for HC, CO, CO_2, and SO_2, while five replicates were conducted for NO_x and O_2. Because of the run-to-run variability for CO at full load gas, five CO measurements were collected at this test condition.

The results show NO_x emissions, corrected to 3% O_2, were 14 ppm on full load gas, 10.5 ppm on low load gas, 30 ppm on full load oil, and 22 ppm on low load oil. These results meet the guarantee requirements of 15 ppmc on gas and 33 ppmc on oil. See Section 4.4 for results corrected to system design conditions.

At full load on oil fuel SO_2 concentrations were 120 ppmc at the inlet and outlet of the SCR, and at low load SO_2 was 123 ppmc at the inlet and 125 ppmc at the outlet. This difference of 2 ppm is less than 1% of the measurement range, and is not considered statistically significant since the accuracy of Method 6C is at best +/- 2-3% of scale. Therefore, the guarantee of no increase in SO_2 across the catalyst is met within the precision of the test method.

CO concentrations were near zero and are reported as less than 5 ppm (1% of scale) for low load gas and for both loads on oil. At full load gas, measured CO was 199 ppmc at the inlet and 246 ppmc at the outlet. Since CO is almost always highly stratified when found on utility boilers and there is no known mechanism by which an SCR system can generate the CO increase seen here, the increase in measured CO across the catalyst is attributed to flue gas stratification that was not adequately characterized by the inlet and outlet sample grids used.

Total hydrocarbon measurements were not detectable (<2 ppm) for all tests at the outlet, and ranged from 2 to 11 ppm at the inlet. It can be concluded that the guarantee of no HC increase across the catalyst was met.

SC

Table 9

SOUTH BAY SCR 1 PERFORMANCE TEST
STACK GASEOUS EMISSIONS RESULTS

Test Day	3	4	5	6
Date, 1997	1-May	2-May	5-May	6-May
Start Time	9:00	8:00	8:12	20:35
End Time	18:31	17:40	17:33	07:00 (7-May)
Fuel	Oil	Gas	Gas	Oil
Load, MW Gross	147	147	33	33
NOx, ppmc				
Run A	29.6	14.2	(1)	23.6
Run B	29.8	14.1	11.4	20.9
Run C	29.0	13.5	12.3	22.1
Run D	30.6	14.1	10.0	23.4
Run E	30.5	14.0	9.2	22.2
Run F	-	-	9.6	-
Average	*29.9*	*14.0*	*10.5*	*22.4*
O2, % dry				
Run A	5.3	3.2	8.0	10.2
Run B	5.1	3.2	7.9	9.9
Run C	4.9	2.9	8.1	9.7
Run D	4.8	3.2	8.2	10.5
Run E	4.9	3.1	7.6	10.8
Run F			8.5	
Average	*5.0*	*3.1*	*8.0*	*10.2*
CO2, % dry				
Run A	11.71	10.08	7.06	8.80
Run B	12.35	10.15	7.02	8.83
Run C	11.82	10.16	6.97	8.74
Average	*11.96*	*10.13*	*7.02*	*8.79*
SO2, ppmc				
Run A	129	-	-	124
Run B	134	-	-	121
Run C	141	-	-	127
Average	*135*	-	-	*124*
CO, ppmc				
Run A	<5	298	<5	<5
Run B	<5	267	<5	<5
Run C	<5	252	<5	<5
Run D	-	274	-	-
Run E	-	458	-	-
Average	*<5*	*310*	*<5*	*<5*

(1) Run A was invalid and replaced by Run F.

8D

Table 10

SOUTH BAY SCR 1 PERFORMANCE TEST
SO2, CO, AND HC AT SCR INLET AND OUTLET

Test Day	3	4	5	6
Date, 1997	1-May	2-May	5-May	6-May
Start Time	9:00	8:00	8:12	20:35
End Time	18:31	17:40	17:33	07:00 (7-May)
Fuel	Oil	Gas	Gas	Oil
Load, MW Gross	147	147	33	33
Inlet SO2, ppmc				
Run A	123	-	-	124
Run B	118	-	-	120
Run C	119	-	-	126
Average	*120*	-	-	*123*
Outlet SO2, ppmc				
Run A	115	-	-	131
Run B	124	-	-	120
Run C	122	-	-	124
Average	*120*	-	-	*125*
Inlet CO, ppmc				
Run A	<5	281	<5	<5
Run B	<5	164	<5	<5
Run C	<5	143	<5	<5
Run D	<5	182	<5	<5
Run E	<5	224	<5	<5
Average	*<5*	*199*	*<5*	*<5*
Outlet CO, ppmc				
Run A	<5	231	<5	<5
Run B	<5	259	<5	<5
Run C	<5	225	<5	<5
Run D	<5	224	<5	<5
Run E	<5	292	<5	<5
Average	*<5*	*246*	*<5*	*<5*
Inlet HC, ppm				
Run A	6.5	10	9.5	<2
Run B	6.5	12	10.5	3
Run C	9	11	12	3
Average	*7*	*11*	*11*	*2*
Outlet HC, ppm				
Run A	<2	<2	<2	<2
Run B	<2	<2	<2	<2
Run C	<2	<2	<2	<2
Average	*<2*	*<2*	*<2*	*<2*

8E

4.2 Ammonia Emissions

The results of the ammonia slip tests at the stack are presented in Table 11. Ammonia emissions were 9.6 ppm at full load gas, 5.4 ppm at low load gas, and 1 ppm or less on oil. Agreement among replicate runs was excellent for all four sets of tests.

These results meet the guarantee levels of 2 ppmc on residual oil fuel and 10 ppmc on natural gas fuel. NH_3 emissions corrected for the SCR performance curves at full load are presented in Section 4.4.

4.3 Particulate Emissions

The results of the particulate tests were summarized in Table 1, and are presented in Tables 12 through 15 for the four individual sets of triplicate runs. The results showed particulate emissions were approximately 3 lb/hr higher with the SCR on at full load, and essentially unchanged at low load. Both of these conditions meet the guarantee of less than a 5.2 lb/hr increase in nonsulfuric acid PM_{10}.

4.4 NO_x and NH_3 Results Corrected Using SCR Performance Curves

The contractual agreement for determination of achievement of guarantee levels calls for correction of test data for variations from design conditions. This section presents corrections to measured test data for variations from design values for inlet NO_x level, catalyst inlet gas flow rate, catalyst inlet gas temperature, and catalyst inlet oxygen concentration.

The corrections presented in this report are based on a set of curves supplied to FERCo by SDG&E, and contained in a fax dated April 28, 1997, from Ed Lewis of B&W to Ellis Jones of SDG&E. Based on these curves, the following approach was taken to correct the test data.

8F

Table 11
SOUTH BAY SCR 1 PERFORMANCE TEST
STACK AMMONIA EMISSIONS RESULTS

Test Day	3	4	5	6
Date, 1997	1-May	2-May	5-May	6-May
Start Time	9:00	8:00	8:12	20:35
End Time	18:31	17:40	17:33	07:00 (7-May)
Fuel	Oil	Gas	Gas	Oil
Load, MW Gross	147	147	33	33
NH3, ppmc				
Run A	1.4	8.9	4.6	(1)
Run B	1.0	9.2	4.6	0.4
Run C	0.6	9.3	4.3	0.3
Run D	0.9	9.8	6.4	0.8
Run E	0.9	10.6	7.3	0.2
Run F	-	-	-	0.4
Average	*1.0*	*9.6*	*5.4*	*0.4*

(1) Run A was invalid and replaced by Run F

Table 12
SOUTH BAY SCR 1 PERFORMANCE TEST
STACK PM10 EMISSION RESULTS
FULL LOAD, SCR OFF, OIL FUEL

Test No.	1A	1B	1C	Average
Date, 1997	29-Apr	29-Apr	29-Apr	
Start Time	11:05	14:16	16:54	
End Time	13:07	15:51	18:35	
O2, % dry at stack	4.72	4.56	4.55	4.61
CO2, % dry at stack	12.47	12.40	12.44	12.44
H2O, %	11.10	11.20	10.30	10.87
Stack temp, °F	249	251	253	251
Std. Sample Volume, dscf	37.12	33.82	34.57	
Stack Flow Rate, dscfm	272,449	277,477	278,421	276,116
Sample Train Data:				
Cut size, microns	9.83	9.76	9.70	
Isokinetics, %	101.86	100.86	102.77	
Particulate weight, mg				
1. Cyclone wash, > 10 microns	3.2	3.3	3.3	
2. Probe wash, PM10	9.3	4.7	8.8	
3. Filter, PM10	2.4	1.4	1.0	
Non sulfuric acid PM10 (2+3)				
gr/dscf	0.0049	0.0028	0.0044	***0.0040***
gr/dscf @ 12% CO2	0.0047	0.0027	0.0042	***0.0039***
lb/hr	11.36	6.62	10.44	***9.47***

Table 13

SOUTH BAY SCR 1 PERFORMANCE TEST
STACK PM10 EMISSION RESULTS
FULL LOAD, SCR ON, OIL FUEL

Test No.	1D	1E	1F	Average
Date, 1997	29-Apr	29-Apr	29-Apr	
Start Time	19:13	21:40	23:45	
End Time	20:48	23:13	01:33 (30-Apr)	
O2, % dry at stack	4.41	4.65	5.16	4.74
CO2, % dry at stack	12.63	12.86	13.69	13.06
H2O, %	10.50	10.70	10.50	10.57
Stack temp, F	257	258	260	258
Std. Sample Volume, dscf	33.73	32.50	32.31	
Stack Flow Rate, dscfm	276,413	281,566	273,284	277,088
Sample Train Data:				
Cut size, microns	10.01	10.06	10.12	
Isokinetics, %	98.77	96.06	98.41	
Particulate weight, mg				
1. Cyclone wash, > 10 microns	2.9	4.0	2.8	
2. Probe wash, PM10	10.9	9.6	9.3	
3. Filter, PM10	0.5	1.6	1.7	
Non sulfuric acid PM10 (2+3)				
gr/dscf	0.0052	0.0053	0.0053	***0.0053***
gr/dscf @ 12% CO2	0.0050	0.0050	0.0046	***0.0048***
lb/hr	12.36	12.83	12.31	***12.50***

8H

Table 14

SOUTH BAY SCR 1 PERFORMANCE TEST
PM10 EMISSION RESULTS
LOW LOAD, SCR OFF, OIL FUEL

Test No.	2A	2B	2C	Average
Date, 1997	30-Apr	30-Apr	30-Apr	
Start Time	8:50	10:48	13:02	
End Time	10:22	12:28	14:34	
O2, % dry at stack	10.62	11.09	10.67	10.79
CO2, % dry at stack	7.77	7.64	7.54	7.65
H2O, %	8.20	10.20	7.90	8.77
Stack temp, F	194	193	193	193
Std. Sample Volume, dscf	34.67	34.13	35.02	
Stack Flow Rate, dscfm	121,555	118,555	123,793	121,301
Sample Train Data:				
Cut size, microns	10.10	9.79	9.76	
Isokinetics, %	97.87	105.16	101.27	
Particulate weight, mg				
1. Cyclone wash, > 10 microns	0.9	2.2	1.1	
2. Probe wash, PM10	8.1	4.7	7.0	
3. Filter, PM10	1.3	1.5	1.4	
Non sulfuric acid PM10 (2+3)				
gr/dscf	0.0042	0.0028	0.0037	***0.0036***
gr/dscf @ 12% CO2	0.0065	0.0044	0.0059	***0.0056***
lb/hr	4.36	2.85	3.93	***3.71***

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Table 15

SOUTH BAY SCR 1 PERFORMANCE TEST
STACK PM10 EMISSION RESULTS
LOW LOAD, SCR ON, OIL FUEL

Test No.	2D	2E	2F	Average
Date, 1997	30-Apr	30-Apr	30-Apr	
Start Time	16:00	17:58	20:00	
End Time	17:33	19:39	21:30	
O2, % dry at stack	10.46	10.50	10.54	10.50
CO2, % dry at stack	7.76	7.73	7.73	7.74
H2O, %	8.20	8.20	8.00	8.13
Stack temp, F	194	195	196	195
Std. Sample Volume, dscf	34.23	34.81	34.42	
Stack Flow Rate, dscfm	119,796	122,697	118,787	120,427
Sample Train Data:				
Cut size, microns	9.67	9.72	9.84	
Isokinetics, %	105.33	102.16	104.02	
Particulate weight, mg				
1. Cyclone wash, > 10 microns	0.5	0.1	0.6	
2. Probe wash, PM10	5.7	7.0	6.0	
3. Filter, PM10	1.0	1.2	1.5	
Non sulfuric acid PM10 (2+3)				
gr/dscf	0.0030	0.0036	0.0034	***0.0033***
gr/dscf @ 12% CO2	0.0047	0.0056	0.0052	***0.0052***
lb/hr	3.10	3.82	3.42	***3.45***

1. Full load data only were evaluated, since the curves were based on full load design data.

2. The "A" curve from each set of curves was used, since the A, B, and C curves represent different catalyst activity levels, A is the highest activity level, and the South Bay 1 catalyst is new.

3. Inlet gas flow rates were calculated from measured stack gas flow rates and measured inlet gas moisture content. Table 16 presents a summary of the gas flow calculations. The inlet flows were calculated as follows:

$$dscfm_{in} = dscfm_{stack} * O_2 \text{ correction factor} \quad (1)$$

$$O_2 \text{ correction factor} = (20.9\text{-stack } O_2)/(20.9\text{-inlet } O_2) \quad (2)$$

$$wscfm_{in} = dscfm_{in} / (1\text{-}H_2O_{in}/100) \quad (3)$$

Inlet flow, $Nm^3/hr = 1.583 * wscfm_{in}$ (unit conversion factor; conditions are 68 °F, normal conditions are 0 °C) (4)

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Table 16
SOUTH BAY SCR 1 PERFORMANCE TEST
FLUE GAS FLOW RATE CALCULATIONS

Test Day	3	4	5	6
Date, 1997	1-May	2-May	5-May	6-May
Start Time	9:00	8:00	8:12	20:35
End Time	18:31	17:40	17:33	07:00 (7-May)
Fuel	Oil	Gas	Gas	Oil
Load, MW Gross	147	147	33	33
Stack gas flow, measured				
Temp, F	255.9	260.6	185.3	205.7
Absolute pressure, in Hg	29.53	29.59	29.82	29.77
Moisture, %	11.2	17.2	14.9	8.4
O2, % dry	5.00	3.13	8.04	10.2
Actual flow, wacfm	418,970	408,160	122,770	149,670
Wet std flow, wscfm	305,068	295,829	100,165	118,166
Dry std flow, dscfm	270,900	244,946	85,240	108,240
Stack gas flow, calculated from fuel flow				
Fuel flow, klb/hr or kscf/hr	66.86	1404	361	16.15
HHV, Btu/lb or Btu/scf	19215	1010	1010	19215
Fd, dscf/mmBtu	9125	8578	8578	9190
Fw, wscf/mmBtu	10412	10573	10573	10320
Wet std flow, wscfm	283,078	285,254	95,521	96,527
Dry std flow, dscfm	256,825	238,442	84,717	92,841
Inlet gas flow, calculated from dry stack flow, using inlet moisture				
Temp, F	673	670	565	620
Absolute pressure, in Hg	30.25	30.21	30.01	30.03
Moisture, %	12.6	20.5	15.8	8.2
O2, % dry	2.84	0.76	5.69	7.59
Actual flow, wacfm	579,174	576,218	165,664	193,173
Wet std flow, wscfm	272,883	271,851	85,594	94,787
Wet std flow, Nm^3/hr	431,974	430,340	135,495	150,049
Dry std flow, dscfm	238,500	216,122	72,070	87,015
Inlet gas flow, calculated from fuel flow				
Wet std flow, wscfm	252,986	257,321	83,359	80,069
Wet std flow, Nm^3/hr	400,478	407,339	131,957	126,749
Dry std flow, dscfm	226,109	210,383	71,628	74,635

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6. The final correction factor was then the product of the individual correction factors:

$$CF = CF_M * CF_Q * CF_T * CF_{O2} \quad (7)$$

where subscript M denotes mole ratio, Q denotes gas flow rate, T denotes temperature, and O_2 denotes oxygen.

7. Corrected NH_3 slip concentrations were determined by multiplying the measured NH_3 slip by the correction factor.

8. Corrected NO_x concentrations were determined as follows:

$$\text{Corrected test } deNO_x = \text{actual } deNO_x * CF_{deNOx} \quad (8)$$

$$\text{Corrected test } NO_x = (100 - \text{corrected } deNO_x) * \text{design inlet } NO_x \quad (9)$$

The results and details of the calculations are presented in Table 17. Correction curves and additional details are included in Appendix F.

The results show that on oil fuel, the corrections changed the measured NO_x from 29.9 ppmc to 32.7 ppmc and the measured NH_3 slip from 1.0 ppmc to 0.8 ppmc. On gas fuel the corrections changed the measured NO_x from 14.0 ppmc to 14.2 ppmc and the measured NH_3 from 9.6 to 9.0 ppmc. All of the corrected values are within the guarantee limits.

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Table 17

SOUTH BAY SCR 1 PERFORMANCE TEST
NOx AND AMMONIA CORRECTIONS TO DESIGN CONDITIONS

Test Day	3			4	
Date, 1997	30-Apr			1-May	
Fuel	Oil			Gas	
Load, MW	147			147	
STACK					
Flow, DSCFM	270,900			244,900	
Moisture, %	11.2			17.2	
Flow, WSCFM	305,068			295,773	
O2, %	5.00			3.13	
NOx, ppmc	29.9			14.0	
NH3, ppmc	1.0			9.6	
INLET					
Design NOx, ppmc	229.9 (1)			150	
Measured NOx, ppmc	222			167	
O2, %	2.84			0.76	
O2 Correction	0.881			0.883	
Moisture, %	12.6			20.5	
Flow, WSCFM	272,883			271,851	
Flow, Nm^3/hr	432,069			430,434	
Temperature, °F	673			670	
Temperature, C	356			354	
CALCULATIONS					
	DeNOx	NH3 Slip		DeNOx	NH3 Slip
Measured DeNOx, %	86.53	n/a		91.62	n/a
Mole Ratio, MT	0.87	0.87		0.97	0.97
Design Mole Ratio, MD	0.86	0.86		0.97	0.97
NH3/NOx Correction Factor	0.992	1.084		0.996	0.938
Flow Correction Factor	0.999	0.664		0.990	1.124
Temp Correction Factor	1.000	1.066		1.002	0.954
O2 Correction Factor	1.000	0.993		1.000	0.930
Final Test Correction Factor	0.991	0.762		0.988	0.935
Measured DeNOx, %	86.5	n/a		91.6	n/a
Corrected Test DeNOx, %	85.8	n/a		90.5	n/a
Corrected NOx Emissions, ppmc (2)	***32.7***	n/a		***14.2***	n/a
Corrected Test NH3, ppmc	n/a	***0.8***		n/a	***9.0***

1. Per B&W revised correction curves
2. Based on design inlet NOx emissions

COMPLIANCE TEST REPORT

UNIT NO. 2 SELECTIVE CATALYTIC REDUCTION SYSTEM

Source Location:

Duke Energy South Bay, LLC
990 Bay Boulevard
Chula Vista, California 91911-1334

Test Dates: February 20-28, 2001
Issue Date: April 24, 2001
Revision: 0

Prepared for:

Duke Energy South Bay, LLC
990 Bay Boulevard
Fairfield, California 91911-1334

Prepared by:

AirKinetics, Inc.
5932 Bolsa Avenue, Suite 105
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AKI No.: 10867

Prepared By: Tony Wong
Tony Wong
President

Reviewed By: Tony Wong for
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Vice President

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AirKinetics, Inc.
EMISSIONS CHARACTERIZATION
AND TESTING SERVICES

2.0 TEST RESULTS AND DATA PRESENTATION

The emissions test results are summarized in Tables 2-1 to 2-4. Fuel oil and natural gas analytical test results are presented in Tables 2-5 and 2-6, respectively. Results tabulations are presented in Appendix A. Example calculations are given in Appendix B. Field data are given in Appendix C. Analytical data are provided in Appendix D. Calibration data are presented in Appendix E. Sampling train schematics are presented in Appendix F. AirKinetics system performance test results are presented in Appendix G. Facility process data are presented in Appendix H. Ammonia raw data package are in Appendix I.

TABLE 2-1

NATURAL GAS (MINIMUM LOAD) TEST RESULTS

Parameter	Units	Run 1	Run 2	Run 3	Average	Emission Limit
Flow Rate	DSCFM	98,831	100,039	96,749	98,207	
O_2	%	8.45	8.42	8.36	8.41	
CO_2	%	7.24	7.29	7.30	7.28	
NO_x	ppm	5.4	2.9	3.8	4.0	
	ppm @ 3% O_2	7.7	4.2	5.4	5.8	
	Lbs/gross MW-hr	0.1057	0.0592	0.0731	0.0793	0.15
Ammonia	ppm	< 0.53	< 0.53	< 0.54	< 0.53	
	ppm @ 3% O_2	< 0.77	< 0.76	< 0.77	< 0.76	10

TABLE 2-2

NATURAL GAS (MAXIMUM LOAD) TEST RESULTS

Parameter	Units	Run 1	Run 2	Run 3	Average	Emission Limit
Flow Rate	DSCFM	299,412	300,977	297,182	299,187	
O_2	%	4.48	4.80	4.55	4.61	
CO_2	%	9.63	9.00	9.42	9.35	
NO_x	ppm	9.7	10.4	10.0	10.0	
	ppm @ 3% O_2	10.6	11.6	11.0	11.1	
	Lbs/gross MW-hr	0.1360	0.1464	0.1383	0.1402	0.15
Ammonia	ppm	< 0.54	< 0.54	1.18	< 0.75	
	ppm @ 3% O_2	< 0.59	< 0.60	1.29	< 0.83	10

TABLE 2-3

FUEL OIL (MINIMUM LOAD) TEST RESULTS

Parameter	Units	Run 1	Run 2	Run 3	Average	Emission Limit
Flow Rate	DSCFM	108,974	109,934	112,227	110,378	
O_2	%	11.04	11.19	11.56	11.26	
CO_2	%	7.86	7.77	7.77	7.80	
NO_x	ppm	9.9	10.3	7.7	9.20	
	ppm @ 3% O_2	17.9	19.0	14.7	17.2	
	Lbs/gross MW-hr	0.2179	0.2293	0.1742	0.2071	0.40
PM10	Lbs/hr (w/NH3)	10.0	8.76	10.3	9.69	
	Lbs/hr (w/o NH3)	10.4	10.0	7.57	9.34	
	Net Increase				0.35	25.9
Ammonia	ppm	< 0.53	< 0.54	< 0.53	< 0.53	
	ppm @ 3% O_2	< 0.96	< 0.99	< 1.03	< 0.99	10

TABLE 2-4

FUEL OIL (MAXIMUM LOAD) TEST RESULTS

Parameter	Units	Run 1	Run 2	Run 3	Average	Emission Limit
Flow Rate	DSCFM	318,262	324,114	318,851	320,409	
O_2	%	5.7	5.64	5.39	5.58	
CO_2	%	11.0	12.28	12.42	11.9	
NO_x	ppm	17.9	22.9	24.8	21.9	
	ppm @ 3% O_2	21.0	26.9	28.6	25.5	
	Lbs/gross MW-hr	0.2615	0.3410	0.3631	0.3219	0.40
PM10	Lbs/hr (w/NH3)	36.9	33.9	39.1	36.6	
	Lbs/hr (w/o NH3)	35.6	38.0	37.0	36.9	
	Net Increase*				-0.3	25.9
Ammonia	ppm	< 0.55	< 0.56	< 0.55	< 0.55	
	ppm @ 3% O_2	< 0.64	< 0.66	< 0.63	< 0.64	10

*The net increase of 0.3 corresponds to a 0.8% change and is within the variability of the test method. (See Section 6.1 for further explanation)

TABLE 2-5

FUEL OIL ANALYTICAL TEST RESULTS

Parameter	Units	3/20/01	3/21/01	3/23/01	3/28/01
API Gravity by Hydrometer	60/60 °F	17.1	16.3	16.8	15.2
Ash Content	wt. %	0.035	0.033	0.039	0.039
BTU, Gross	BTU/lb	18,378	18,309	18,209	18,323
Carbon Content	wt. %	87.2	85.86	86.03	86.61
Hydrogen Content	wt. %	11.64	10.90	11.38	11.05
Nitrogen Content	wt. %	0.19	0.26	0.25	0.32
Oxygen Content	wt. %	0.64	2.00	2.25	1.49
Total Sulfur	wt. %	0.332	0.337	0.332	0.364
Vanadium	ppm	5.6	5.2	5.8	6.9

TABLE 2-6

NATURAL GAS ANALYTICAL TEST RESULTS

Parameter	Units	2/26/01	2/27/01
C6+	Mole %	0.0353	0.0356
C02	Mole %	1.03	0.978
ETHANE	Mole %	1.58	1.69
IBUTANE	Mole %	0.0390	0.0410
IPENTANE	Mole %	0.0204	0.0214
METHANE	Mole %	96.0	95.9
NBUTANE	Mole %	0.0734	0.0761
NEOPENTANE	Mole %	0	2.86E-05
NITROGEN	Mole %	0.907	0.940
NPENTANE	Mole %	0.0197	0.0198
PROPANE	Mole %	0.301	0.322
SPECIFIC GRAVITY	NA	0.582	0.583
Dry Btu	MMBTU/SCF	1017	1018

COMPLIANCE TEST REPORT

UNIT NO. 3 SELECTIVE CATALYTIC REDUCTION SYSTEM

Source Location:

Duke Energy South Bay, LLC
990 Bay Boulevard
Chula Vista, California 91911-1334

Test Dates: April 18 and May 22, 23, and 25, 2001
Issue Date: July 20, 2001
Revision: 0

Prepared for:

Duke Energy South Bay, LLC
990 Bay Boulevard
Fairfield, California 91911-1334

Prepared by:

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Prepared By: Tony Wong
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Reviewed By: Son Bui
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EMISSIONS CHARACTERIZATION
AND TESTING SERVICES

2.0 TEST RESULTS AND DATA PRESENTATION

The emissions test results are summarized in Tables 2-1 to 2-4. Fuel oil analytical test results are presented in Table 2-5. Results tabulations are presented in Appendix A. Example calculations are given in Appendix B. Field data are given in Appendix C. Analytical data are provided in Appendix D. Calibration data are presented in Appendix E. Sampling train schematics are presented in Appendix F. AirKinetics system performance test results are presented in Appendix G. Facility process data are presented in Appendix H. Ammonia raw data package are in Appendix I.

TABLE 2-1
NATURAL GAS (MINIMUM LOAD) TEST RESULTS

Parameter	Units	Rep. 1	Rep. 2	Rep. 3	Average	Limit
Without Ammonia						
Temperature	°F	154.1	153.8	154.1	154.0	
O_2	%	10.39	10.31	10.24	10.31	
CO_2	%	5.96	5.99	6.03	5.99	
H_2O	%	9.43	11.10	12.47	11.00	
Static Pressure	Inches H_2O	-0.26	-0.26	-0.30	-0.27	
Volumetric Flow Rate	dscfh	7,924,600	7,693,300	7,790,400	7,802,800	
NO_x	ppm @ 3% O_2	60.4	59.4	58.9	59.6	
	lb/MW-hr	0.941	0.908	0.916	0.922	
With Ammonia						
Temperature	°F	154	154	150	152	
O_2	%	10.23	10.45	10.29	10.32	
CO_2	%	5.97	5.89	6.00	5.95	
H_2O	%	12.0	12.7	12.2	12.3	
Static Pressure	Inches H_2O	-0.26	-0.32	-0.32	-0.30	
Volumetric Flow Rate	dscfh	7,807,500	7,817,400	8,140,100	7,921,700	
NO_x	ppm @ 3% O_2	8.7	9.0	7.6	8.4	
	lb/MW-hr	0.137	0.138	0.123	0.133	0.15
NH_3 Slip	ppm @ 3% O_2	0.90	0.94	0.91	0.91	10

TABLE 2-2
NATURAL GAS (MAXIMUM LOAD) TEST RESULTS

Parameter	Units	Rep, 1	Rep. 2	Rep. 3	Average	Limit
Without Ammonia						
Temperature	°F	259.4	258.9	261.2	259.8	
O_2	%	10.19	10.20	10.16	10.18	
CO_2	%	2.87	2.86	2.95	2.89	
H_2O	%	17.95	18.26	17.42	17.88	
Static Pressure	Inches H_2O	-1.35	-1.25	-1.25	-1.28	
Volumetric Flow Rate	dscfh	20,098,400	19,611,200	20,052,400	19,920,700	
NO_x	ppm @ 3% O_2	144.4	143.3	145.5	144.4	
	lb/MW-hr	1.890	1.824	1.878	1.864	
With Ammonia						
Temperature	°F	262	264	263	263	
O_2	%	3.04	3.26	3.23	3.18	
CO_2	%	10.09	9.99	10.03	10.04	
H_2O	%	18.6	18.0	18.7	18.4	
Static Pressure	Inches H_2O	-1.00	-1.10	-1.10	-1.07	
Volumetric Flow Rate	dscfh	20,167,600	20,441,400	20,416,600	20,341,900	
NO_x	ppm @ 3% O_2	11.6	10.9	10.9	11.1	
	lb/MW-hr	0.151	0.141	0.141	0.144	0.15
NH_3 Slip	ppm @ 3% O_2	4.16	5.70	5.77	5.21	10

TABLE 2-3
FUEL OIL (MINIMUM LOAD) TEST RESULTS

Parameter	Location	Rep. 1	Rep. 2	Rep. 3	Average	Limit
Without Ammonia						
Temperature	°F	150.4	151.9	150.5	150.9	
O_2	%	6.68	6.73	6.79	6.73	
CO_2	%	11.33	11.36	11.32	11.34	
H_2O	%	9.0	9.2	8.6	8.9	
Static Pressure	Inches H_2O	-0.27	-0.27	-0.27	-0.27	
Volumetric Flow Rate	dscfh	8,215,600	8,029,400	8,031,600	8,092,200	
NO_x	ppm @ 3% O_2	117.3	117.5	122.98	119.3	
	lb/MW-hr	1.71	1.67	1.74	1.71	
PM10 (w/o NH3)	lbs/hour	12.7	13.8	12.0	12.8	
	grains/dscf @ 12% CO_2	0.0116	0.0127	0.0112	0.0118	
With Ammonia						
Temperature	°F	151.4	151.2	151.8	151.4	
O_2	%	6.72	6.64	6.62	6.66	
CO_2	%	11.33	11.40	11.35	11.36	
H_2O	%	9.1	9.2	8.5	8.9	
Static Pressure	Inches H_2O	-0.27	-0.27	-0.27	-0.27	
Volumetric Flow Rate	dscfh	7,915,500	7,898,100	7,906,400	7,906,700	
NO_x	ppm @ 3% O_2	29.3	33.0	31.8	31.4	
	lb/MW-hr	0.411	0.469	0.448	0.443	0.40
NH_3 Slip	ppm @ 3% O_2	3.61	6.04	14.32	7.99	10
PM10 (w/NH3)	lbs/hour	42.7	38.3	34.8	38.6	
	grains/dscf @ 12% CO_2	0.0404	0.0361	0.0329	0.0365	
PM10 Increase	lbs/hour	30.0	24.5	22.8	25.8	34.1

TABLE 2-4
FUEL OIL (MAXIMUM LOAD)

Parameter	Location	Rep. 1	Rep. 2	Rep. 3	Average	Limit
Without Ammonia						
Temperature	°F	248.8	250.3	253.5	250.8	
O_2	%	3.31	3.56	3.52	3.46	
CO_2	%	13.82	13.61	13.67	13.70	
H_2O	%	11.3	10.7	11.4	11.1	
Static Pressure	Inches H_2O	-0.95	-1.05	-1.03	-1.01	
Volumetric Flow Rate	dscfh	19,622,300	19,709,100	19,621,600	19,651,000	
NO_x	ppm @ 3% O_2	251.2	262.5	266.4	260.0	
	lb/MW-hr	3.216	3.321	3.344	3.290	
PM10 (w/o NH3)	lbs/hour	42.7	36.0	36.4	38.4	
	grains/dscf @ 12% CO_2	0.0130	0.0111	0.0115	0.0118	
With Ammonia						
Temperature	°F	247.4	248.6	249.4	248.5	
O_2	%	3.37	3.29	3.20	3.29	
CO_2	%	13.81	13.87	13.93	13.87	
H_2O	%	11.2	11.2	10.1	10.8	
Static Pressure	Inches H_2O	-1.00	-0.89	-0.92	-0.94	
Volumetric Flow Rate	dscfh	19,794,400	20,123,400	19,486,100	19,801,300	
NO_x	ppm @ 3% O_2	23.8	23.9	23.9	23.9	**26.6**
	lb/MW-hr	0.307	0.313	0.304	0.308	0.40
NH_3 Slip	ppm @ 3% O_2	1.49	1.48	1.32	1.43	10
PM10 (w/NH3)	lbs/hour	48.4	52.2	44.1	48.2	
	grains/dscf @ 12% CO_2	0.0148	0.0156	0.0136	0.0147	
PM10 Increase	lbs/hour	5.7	16.2	7.7	9.9	34.1

TABLE 2-5

FUEL OIL ANALYTICAL TEST RESULTS

Parameter	Units	4/18/01	5/25/01
Specific Gravity	@ 60 °F	0.9759	0.9738
BTU, Gross	BTU/lb	18,375	18,319
Carbon Content	wt. %	87.69	87.26
Hydrogen Content	wt. %	10.64	11.00
Nitrogen Content	wt. %	0.29	0.26
Oxygen Content	wt. %	1.52	1.67
Total Sulfur	wt. %	0.386	0.384
Vanadium	ppm	6.5	6.6

COMPLIANCE TEST REPORT

UNIT NO. 4 STACK

Source Location:

Duke Energy South Bay, LLC
990 Bay Boulevard
Chula Vista, California 91911-1615

Test Dates: February 5 through 7 and March 14, 2002
Issue Date: May 2, 2002
Revision: 0

Prepared for:

Duke Energy South Bay, LLC
990 Bay Boulevard
Chula Vista, California 91911-1615

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AirKinetics, Inc.
EMISSIONS CHARACTERIZATION
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2.0 TEST RESULTS AND DATA PRESENTATION

The emissions test results are summarized in Tables 2-1 to 2-2. Fuel oil analytical test results are presented in Table 2-3. Results tabulations are presented in Appendix A. Example calculations are given in Appendix B. Field data are given in Appendix C. Analytical data are provided in Appendix D. Calibration data are presented in Appendix E. Sampling train schematics are presented in Appendix F. AirKinetics system performance test results are presented in Appendix G. Facility process data collected by AirKinetics are presented in Appendix H.

TABLE 2-1
NATURAL GAS TEST RESULTS

Parameter	Units	Rep. 1	Rep. 2	Rep. 3	Average	Limit
With Ammonia						
Date		2/5/02	2/5/02	2/5/02		
Run Time		0840-0926	1011-1054	1130-1214		
O_2	%	1.34	1.35	1.30	1.33	
CO_2	%	10.94	10.98	11.05	10.99	
H_2O	%	16.4	16.8	17.4	16.9	
NO_x	ppm @ 3% O_2	8.2	6.3	9.5	8.0	
	lbs/Gross MW-hr	0.127	0.099	0.147	0.12	0.15
NH_3 Slip	ppm @ 3% O_2	0.699	1.664	0.482	0.948	10

TABLE 2-2
FUEL OIL TEST RESULTS

Parameter	Location	Rep. 1	Rep. 2	Rep. 3	Average	Limit
Without Ammonia						
Date		2/6/02	2/6/02	2/6/02		
Run Time		1130-1319	1320-1506	1600-1751		
O_2	%	2.34	2.63	4.10	3.02	
CO_2	%	14.27	14.01	12.96	13.75	
NO_x	ppm @ 3% O_2	225.7	237.3	225.6	229.5	
	lbs/Gross MW-hr	3.715	3.737	3.395	3.616	
PM10	lbs/hour	68.6	58.7	68.6	65.3	
	grains/dscf @ 12% CO_2	0.0135	0.0122	0.0148	0.0135	
With Ammonia						
Date		3/14/02	3/14/02	3/14/02		
Run Time		0940-1138	1139-1324	1617-1759		
O_2	%	3.0	2.5	2.5	2.7	
CO_2	%	13.8	13.4	13.5	13.6	
NO_x*	ppm @ 3% O_2	24.5	26.4	22.9	24.6	
	lbs/Gross MW-hr	0.350	0.376	0.326	0.351	0.40
NH_3 Slip	ppm @ 3% O_2	0.16	0.10	0.06	0.11	10
PM10	lbs/hour	68.1	55.4	64.9	62.8	
	grains/dscf @ 12% CO_2	0.0134	0.0110	0.0128	0.0124	
PM10 Increase	lbs/hour				-2.5	4.1

* Facility CEMS data was used to demonstrate compliance per SDAPCD

TABLE 2-3

FUEL OIL ANALYTICAL TEST RESULTS

Parameter	Units	02/06/02 Fuel Oil-A	03/14/02
API Gravity by Hydrometer	@ 60 °F	18.6	
BTU, Gross	BTU/lb	18711	18608
Carbon Content	wt. %	86.23	88.02
Hydrogen Content	wt. %	11.64	11.92
Nitrogen Content	wt. %	0.19	<0.05
Oxygen Content	wt. %	2.12	<0.10
Total Sulfur	wt. %	0.311	
Vanadium	ppm	4.3	3.9

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Alternatives
Author: Susan Lee

BACKGROUND

The California Environmental Quality Act (CEQA) requires that a reasonable range of alternatives be considered. The applicant has identified six alternative sites to study including four at inland locations. Depending on the project's potentially significant impacts and mitigation, staff may need to study other sites.

DATA REQUEST

36. Given that the current South Bay Power Plant design incorporates air cooling and eliminates the need for Bay water, please discuss the reasons LS Power has for needing to build on a coastal site, as opposed to an inland site.

Response: While the source and availability of cooling water is an important consideration in the location of a power generation project, it is only one of several critical site considerations. In fact, each of the subject areas examined in the CEC certification process is a critical element in a siting decision. Additional important site considerations include, access to gas and electric infrastructure, zoning, environmental impacts, land use in the surrounding area, availability of air emissions offsets, soils composition, view shed, commercial viability, and the development objectives of the general community. The site of the SBRP optimizes these critical elements and was selected following a careful consideration and rejection of all other known potential viable sites. While the Applicant's decision to propose dry cooling in lieu of the use of sea water for once-through cooling on a coastal site is consistent with the policies of the California Coastal Commission, for SBRP this was a close call that balanced engineering and economic realities with the need for new in basin generation, consultation with local stakeholders, the attributes of the proposed site, the reuse of previously used industrial infrastructure, local economic benefits, the needs and interests of the surrounding community, and the political realities of coastal development.

Importantly, the construction and operation of the SBRP on the proposed site provides certainty that the existing SBPP will be removed from service and demolished on a schedule that facilitates the advancement of the Chula Vista Bayfront Master Plan (CVBMP). Upon commercial operation of the SBRP, the existing SBPP and associated SDG&E South Bay Substation will be taken out of service and demolished. Completion of the demolition and relocation of these facilities makes available approximately 115 acres for other uses as part of the CVBMP. The location of the SBRP on a contiguous parcel ensures that the Reliability Must Run (RMR) obligations imposed on the existing SBPP by the CAISO can be assumed by the SBRP. It also reduces air emissions in the local area, ensures that the air emission credits provided by the retirement of the existing SBPP can be fully utilized in a new efficient clean combined-cycle power plant, improves the viewshed, and provides significant economic benefits to the local area through local employment, sales and property taxes.

The proposed site is strategically located and the SBRP will be optimally interconnected to the existing electric and gas transmission systems. Utilization of the proposed site for

power generation ensures that existing energy infrastructure is reused and reduces the potential for incremental impacts of alternative sites or previously unused land. Additionally, siting the SBRP at the proposed site enhances electrical system reliability, reduces the need for new transmission projects, and reduces dependency on less efficient in basin generation.

BACKGROUND:

In order to compare environmental impacts of alternative sites with the impacts of the proposed South Bay site, it is important to understand the relationship of the existing facility with the new facility, and the timing of removal of the existing South Bay plant.

DATA REQUESTS:

37. If the South Bay plant was replaced at a different location, please discuss whether the existing South Bay facility would be closed and demolished according to the same timeframe proposed in the AFC.

Response: Pursuant to the Lease between LSP South Bay, LLC and the San Diego Unified Port District for the operation of the existing SBPP, the lease ends *"…on the latest to occur of the date of payment in full and retirement of the bonds,…. the termination of the ISO of (and the failure by ISO to subsequently reinstate) those must run obligations imposed by ISO under the Must-Run Contract in respect of the facility, and the last day of the primary term…"* Within a reasonable time after the Lease expiration date, LSP South Bay, LLC *must commence and diligently pursue* its *End of Term Actions* which include the decommissioning of the SBPP.

Absent the successful development of the SBRP on the proposed site, it is unclear when CAISO will remove and fail to reinstate the must run obligations (RMR) of the SBPP. It is also unclear if another project at another site would accelerate or have a direct effect on such a decision by CAISO.

Assuming that another viable site could be located, based on recent project development experience, the Applicant estimates that the development of an alternate project at an alternate site would take between four and six years from commencement of development activities to commercial operation. Assuming that such alternate project resulted in the CAISO's termination of the RMR status for the SBPP (which cannot be determined at this time), and assuming that other termination conditions in the lease had been met, demolition of the SBPP could be completed in an additional three to four years. Assuming alternate project development activities commenced in 2009, (nominal primary term of existing lease) it is unlikely that the existing SBPP would be closed and demolished in the same time frame contemplated in the AFC for the SBRP. [Note: this hypothetical schedule excludes the demolition of the existing SDG&E South Bay Substation. The relocation of this facility will require the siting and construction of a replacement substation by SDG&E, which would occur sometime after the demolition of the SBPP consistent with the Memorandum of Understanding between SDG&E and the City of Chula Vista.]

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

BACKGROUND:

Figure 9.5-1 (Location of Alternative Sites Considered) in the AFC depicts the North County Inland Site #3 as being located west of Interstate 15, near Fallbrook. However, the air photo and map provided in Data Response Set 1A (Google Maps air photo) depict the site as being located on Rainbow Heights Road, east of Interstate 15 and southeast of the town of Rainbow. The site is described as being owned by SDG&E and as having a transmission line bisecting it.

DATA REQUESTS:

38. Please state which location for North County Inland Site #3 is correct. If the Fallbrook location is correct, provide a detailed map and directions for getting to the site. If the site included in Data Response, Set 1A is correct (the site east of I-15, near Rainbow), explain the rationale for choosing this site for possible location of a power plant. The site is in a very remote location, in an area of rural residences, and is accessible only by narrow and partially paved roads.

    Response: The North County Inland Site #3 is shown on Figure ALT-38. Site # 3, along with a site located adjacent to the SDG&E Pala Substation, were reviewed as alternatives sites to the proposed SBRP site at the request of SDG&E. In the Applicant's opinion, both of these sites had significant site access issues, are located rural areas, and have significant constraints associated with water and natural gas access.

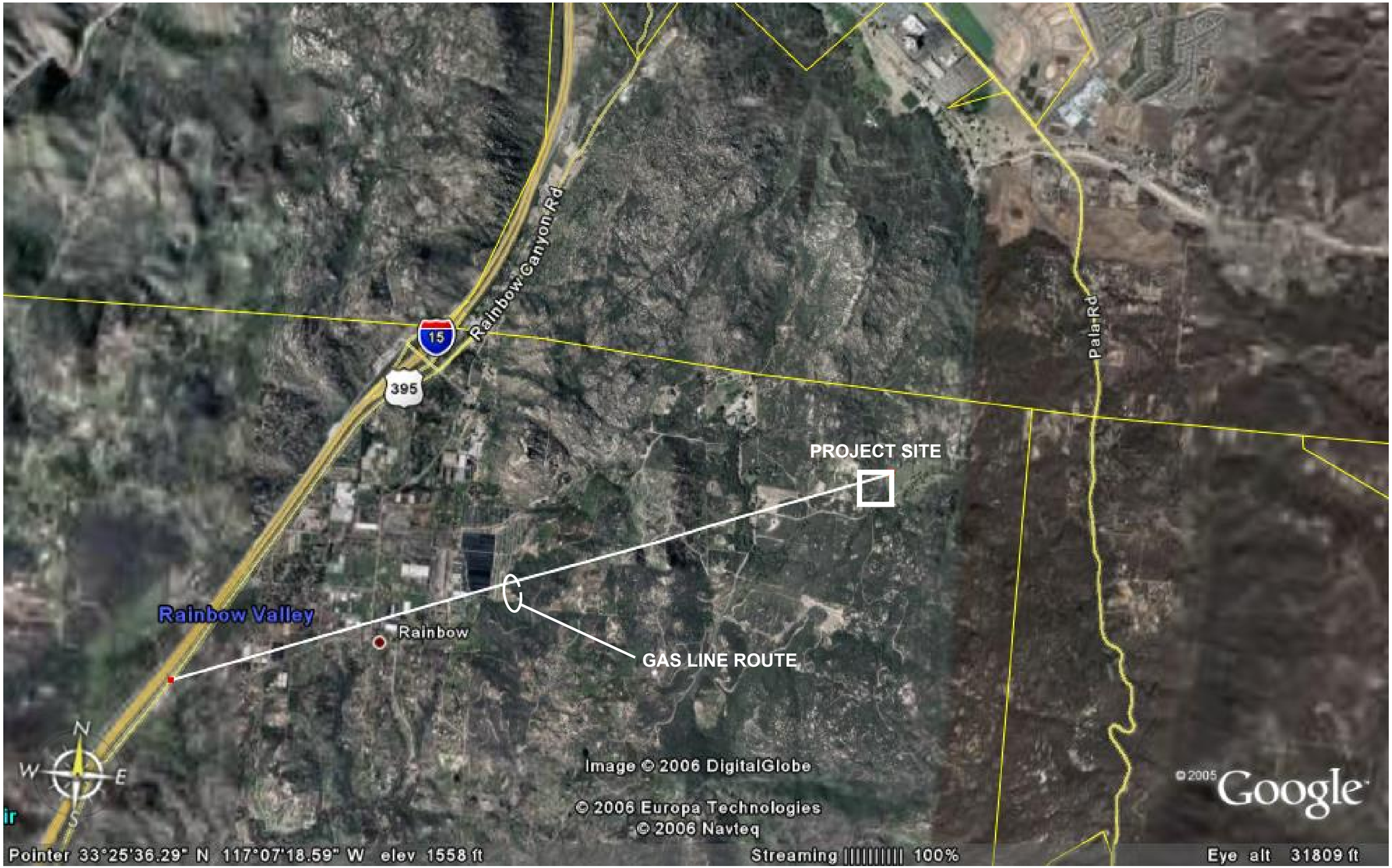

FIGURE ALT-38
SITE 6 NORTH COUNTRY
INLAND SITE #3
SOUTH BAY REPLACEMENT PROJECT
CHULA VISTA, CALIFORNIA

CH2MHILL

EY062006001SAC ALT_38 11-21-06 sbm

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Biological Resources
Author: Joanna Grebel

BACKGROUND

Telegraph Canyon Creek flows through the South Bay Power Plant (SBPP) project site. Although it is cement lined, sediments from stormwater discharges upstream accumulate and support sparse wetland vegetation. The mouth of the creek supports both coastal salt marsh habitat and riparian vegetation. The estuary seablite (*Suaeda esteroa*), a special status plant species, was found inhabiting the mouth of Telegraph Canyon Creek. Hundreds of waterfowl and shorebirds were also found to congregate at the mouth of Telegraph Canyon Creek during 2006 field surveys. Additional sedimentation, potentially resulting from construction activities, can have adverse impacts on flora and fauna inhabiting the creek. The AFC states that Telegraph Canyon Creek may fall under the jurisdiction of the U.S. Army Corps of Engineers and require a Federal Clean Water Act Section 404 permit and a Section 401 water quality certification from the San Diego Regional Water Quality Control Board.

DATA REQUESTS

39. Please provide detailed information (i.e. correspondence with agencies) on the status of federal and state consultations for the Section 404 permit and the Section 401 certification. Please indicate when permit applications have been/will be filed and explain the schedule for completing the federal process.

    Response: Telegraph Canyon Creek is entirely concrete-lined from the point where the creek enters the SBPP property on the eastern boundary to the point approximately 1,400 feet downstream where it opens up to tidal mudflats and the J Street salt marsh that extends into San Diego Bay. The Unified Port District of San Diego (Port) owns the SBPP site, which it leases to the Applicant. As part of the Port's Chula Vista Bayfront Master Plan, the Port makes note of a preliminary concept to potentially modify the concrete lined portion of Telegraph Canyon Creek (for more information on this concept, CEC staff may want to review the Port's Draft EIR for the Chula Vista Bayfront Master Plan).

    It is important to note that any potential modifications to the portion of Telegraph Canyon Creek on the SBBP site will be accomplished by the Port as part of the Bayfront Master Plan, and that such potential modifications are not a part of the SBRP project, nor are they a part of the demolition of the existing SBPP. Therefore, as part of the SBRP project and the demolition of the existing SBPP, the Applicant will not need to obtain a Section 404 Permit or Section 401 Water Quality Certificate related to Telegraph Canyon Creek.

    As part of a separate project not related to the existing SBPP or the SBRP project, SDG&E recently (September/October 2006) installed new underground transmission lines under Telegraph Canyon Creek within the 300-foot wide SDG&E utility easement along the eastern property boundary of the existing SBPP (adjacent to Bay Blvd) using the jack and bore method. The transmission line was installed successfully and no sediment or construction debris was released to the creek.

To support the SBRP project, SDG&E will construct a new natural gas pipeline in the SDG&E 300-foot easement. Based on a preliminary conceptual design from SDG&E, this new natural gas pipeline will also be installed under Telegraph Canyon Creek. While the construction method to be used is the responsibility of SDG&E, the jack and bore method may be technically feasible or an alternate construction method, such as horizontal directional drilling (HDD), may be selected by SDG&E. Either method will avoid direct impacts to the concrete-lined Telegraph Canyon Creek, and avoid impacts to the riparian and mudflat habitats and water quality at the month of the creek as it enters the Bay.

40. Please provide a discussion of direct and indirect impacts to species inhabiting the creek and any species-specific mitigation measures proposed by the applicant.

Response: Migratory birds, primarily waterfowl and shorebirds forage on benthic invertebrates in the mudflats and sediments within Telegraph Canyon Creek. American widgeon, cinnamon teal, American coot, mallard, gadwall, marbled godwit, Western sandpiper, least sandpiper, willet, black-necked stilt, and other water birds routinely use the creek channel to supplement forage or rest during migration as the creek channel is relatively protected from public access and disturbance as it transects the existing SBPP site. No waterfowl or shorebirds nest in the creek channel. Construction of the natural gas pipeline by SDG&E in support of the SBRP under the portion of Telegraph Canyon Creek that is located within the 300-foot SDG&E easement that borders the SBPP site on the east, is not expected to result in direct or indirect impacts to the waterfowl or shorebirds. Resident bird species such as black phoebe, red-winged blackbird, and hummingbirds could use the vegetation growing in sediment at the eastern end of the creek as nesting substrate. Noise from construction activities could temporarily disrupt nesting opportunities for these birds. To mitigate potential impacts to nesting birds in the creek, construction in the vicinity of Telegraph Canyon Creek would be performed during the non-nesting season (starting late summer through winter) and would be completed within one to two weeks.

Direct impacts to the aquatic habitat within Telegraph Canyon Creek will be directly avoided with the use of either the jack and bore method or horizontal directional drilling (HDD) for installation of the natural gas pipeline. If HDD is selected by SDG&E as the preferred construction method, temporary potential impacts to aquatic habitat and benthic invertebrates could occur if inadvertent return of drilling mud (most often referred to as a "frac-out") escapes through a seam in the concrete lining or fissure in the soil structure to the surface. HDD requires a drilling lubricant or "mud" to enable and maintain the bore tunnel. Bentonite slurry, a fine-grain clay material, may be used. Bentonite is non-toxic, but could potentially cover aquatic plants, benthic invertebrate and fish eggs if accidentally discharged into the aquatic habitat. A Contingency Plan for Inadvertent Returns of Drilling Mud (frac-out) would be prepared that addresses how the impacts would be kept to a minimum. The main components of the contingency plan are: 1) stop drilling when return of drilling mud slows/ceases or a spill is observed, 2) contain the spill, 3) pump drilling mud from the containment area back to drill rig or frac truck, and 4) drilling will not resume until containment is completed. Any spill will

be cleaned up and removed from the site to an approved non-toxic waste disposal site. A biological monitor will be on site during the HDD set up procedures and drilling operations. The biological monitor will assist the SDG&E contractor with monitoring for frac-outs, containment, and clean up procedures as needed. The Designated Biologist will inform the appropriate agencies (USFWS, NMFS, CDFG, and SDRWQCB) of the spill and any associated impacts and will implement conditions required as a result. The contingency plan will be kept on site during the HDD construction and will contain contact phone numbers for an emergency coordination of a frac-out.

The northern boundary of the SBRP site is located approximately 2,400 to 3,000 feet from the riparian and salt marsh habitats located at the mouth of Telegraph Canyon Creek as it enters the Bay. Due to this distance, construction related activities and noise levels, and operational activities and noise level from at the SBRP site will not disturb birds that may nest in the riparian and salt marsh habitat at the mouth of Telegraph Canyon Creek.

Activities and noise from demolition related activities of the existing SBPP structures near Telegraph Canyon Creek could temporarily disturb birds that may nest in the salt marshes at the mouth of the creek. As discussed in Section 8.2.4.3.4 of the AFC, demolition activities along the bay shoreline are planned to occur outside the nesting season so as to minimize potential impacts to breeding birds (see that section for further details).

BACKGROUND

The AFC indicates that there is evidence of wetland vegetation on site and states that indicator species were found "…suggesting the area is developing marginal wetland characteristics", yet concludes no wetlands are present on site.

DATA REQUEST

41. Please explain the conclusion for the absence of wetlands, in the presence of wetland indicator species on both SBPP and SBRP sites.

Response: Preliminary wetland determinations conducted during the SBRP AFC analysis showed some wetland characteristics in several areas as shown on Figure 8.2-3 in the AFC. Wetland characteristics observed include marginal wetland plant species (primarily facultative, occurring equally in wetlands and uplands), inconsistent hydrology (enough rainfall to pond water long enough for wetland vegetation to grow) in most years, and non-hydric soils (fill material from the Bay contains marine shells, gravel, and small rocks and does not show indicators of hydric soil). Typically, the USACE requires all three parameters to be met in designating an area as wetland under their jurisdiction. The USACE would make a jurisdictional determination of these potential wetland areas after a formal wetland delineation is completed. All potential wetland areas on the property are man-made on fill material introduced to the site. The SBRP and SBPP sites are located on land owned by the Port and leased to the Applicant. It is the Port's policy, that applicants/tenants on Port property are required to obtain, as appropriate Section 404 permits, Section 401 water quality certificates, and/or Section 10 of the Rivers and Harbor Act permits required for a specific project. Therefore, for the

SBRP, the Applicant has the responsibility to obtain such permits that may be required. The Applicant will initiate the wetlands delineation process with the USACE to support the SBRP project. A copy of the wetland delineation will be submitted to the CEC when completed (expected in early 2007).

BACKGROUND

Demolition of SBPP would include removal of the headwall from the intake and effluent channels, with the shoreline being reconstructed to match the existing hard shore infrastructure. Headwall demolition could introduce sediments into the bay that could affect marine resources, both directly and indirectly. Construction activities occurring in the shoreline and bay water can elevate turbidity levels that could decrease the photosynthetic ability of phytoplankton, kelp, and eelgrass and reduce the ability of sight-foraging birds to see and catch their fish prey in the Bay's water columns.

DATA REQUESTS

42. Please discuss the headwall removal process, including the timing (seasonality) of the removal, what type of equipment will be used, disposal of headwall debris, and any engineering plans necessary for removal. Discuss measures to be used for marine species that would be affected by headwall removal

Response: It is anticipated that removal/demolition activities at the intake and discharge channels for the existing SBPP will take place during the fall and winter months after commercial operations have been achieved for the SBRP and the existing SBPP is shut down (assumed to occur in the spring/summer of 2010), and can be accomplished in one fall/winter season, thus minimizing impacts on spring and summer nesting birds in adjacent habitats. The demolition work on the intake and discharge channels will likely require slightly different methods and equipment. Physical barriers will be erected to isolate the removal activities from the open Bay waters, and to minimize the impact to the biological habitat in and around the intake and discharge channels. These barriers will likely be "soft" barriers, i.e. of a synthetic or textile nature, rather than a typical hard nature such as that of steel sheet piling. Typically, soft barriers are weighted on the bottom, and will create a seal as they rest on the floor of the channel. As a representative example only, Attachment BIO-42 provides information on soft barrier from a manufacturer. This type of installation will limit sediment disturbance, especially when compared to driving materials into the channel floor, which is common practice for sheet pile barriers. Removal and demolition activities will occur inside one or several of these barriers as needed to contain sediments, and may be completed in wet, partially dewatered, or fully dewatered conditions. One possible removal scenario could involve using the existing SBPP intake pumps to partially dewater the intake channel, exposing the areas of the intake headwall structures that will be removed, but leaving enough water to cover any eelgrass plants that may be located within the intake channel. This will allow for easier access to the work area, allowing the removal to be done in relatively dry conditions. Figure BIO-42a shows a possible layout for barrier placement in the intake channel. Please note this plan is conceptual only, and a more detailed plan which identifies specific barrier materials,

locations and dimensions will be provided by the demolition contractor that will be selected prior to implementation.

The intake channel's headwall structures will be removed to depths that are four feet below surface grade, four feet below shoreline slope, and four feet below mean low tide level. Equipment used during the removal and demolition activities will likely include a large crane for lifting various elements of the headwall, hydraulic rams for breaking concrete, various concrete saws for cutting concrete and steel, and excavators, backhoes and wheeled loaders for removing and loading headwall debris into bins/trucks for offsite recycling and/or disposal. Other miscellaneous equipment such as service trucks, dust inhibiting equipment, air compressors and portable generators may also be utilized. Demolition equipment would remain on the shoreline and not down in the bottom of the intake channel. The in-water physical barriers will remain in place throughout demolition activities of the intake and discharge channels.

The discharge channel contains four discharge/diffuser structures that reside on the side slope of the of the north side of the channel. These structures are below the mean low tide level, and will be abandoned in place by filling with rock, rip rap, or other inert, sediment-free material. The removal activity within the discharge channel is anticipated to be performed in a non-dewatered condition. Sediment containment barriers will be placed around the pipe bridge during demolition and placement of any rip rap where the bridge once existed. Figure BIO-42b shows a possible layout for barrier placement in the discharge channel. Please note this plan is conceptual and a more detailed plan, which identifies specific locations and dimensions, will be provided by the demolition contractor that will be selected prior to implementation.

It should be noted that separate pipe bridges span each of the two channels. The removal of these bridges, and the caissons that support them will involve placing similar soft barriers on either side of the bridges, to isolate the area being disturbed, thus minimizing impacts on marine species. It is likely that equipment mounted on a barge will be used to gain access to more easily remove these bridges. It is also likely that removal of the pipe bridge in the intake channel will occur prior to any headwall removal. Should a barge be utilized for this removal work, the appropriate navigational approvals, such as with Coast Guard, USACE, and the Port, will be required prior to any work being performed.

43. Please provide information on how the rip rap will be restructured and what will be done to mitigate any temporary or permanent impacts to sensitive species. Please include a discussion of the timing (seasonality) of the rip rap removal, what type of equipment will be used, and any engineering plans that may be necessary for removal.

Response: It is anticipated that most of the existing rip rap will remain undisturbed during the demolition process within the intake and discharge channels. Exceptions will occur where the installation of soft barriers contact the shoreline. In these areas, rip rap will be removed by equipment such as excavators, backhoes or clam bucket. Disturbance is expected to be minimal, but some unavoidable turbidity increases may occur. Where the intake headwall structures are removed, rip rap will be used as a replacement

material to re-contour the shoreline to closely match the existing, rip rapslope. Rip rap material will be of similar size and structure of the existing rip rap. Installation of rip rap will occur following the headwall removal activities, and while the soft barriers are still in place. This work will also be completed during the same fall/winter timeframe. Upon removal of the soft barriers, rip rap replacement will occur in those areas left void by the soft barriers. The placement of this rip rap will involve a careful process of emplacement by using excavator or clam buckets, beginning deposition below the waterline, and working its way upward. During initial rip rap removal prior to placing sediment barriers, and when rip rap is replaced after the barriers are removed, there will be some unavoidable incidental sediment disturbance. Figure BIO-42a shows a possible layout for barrier placement in the intake channel. Additional engineering plans will be required by the selected demolition contractor prior to implementation in 2010.

The intake and discharge channels attract the green sea turtle (*Chelonia mydas*) that forage on eelgrass in the Bay. Green sea turtles have been sighted using the warm water discharge from the existing SBPP during cold periods. Prior to installation of the soft barriers that will isolate the landward portion of the intake/discharge channels from the Bay, qualified biologists will be on site to exclude turtles from the work areas. A detailed plan to conduct the exclusion activities would be developed directly with the National Marine Fisheries Service biologists. This plan would be included in the Biological Assessment for conducting the formal consultation under Section 7 of the Endangered Species Act and become a condition of demolition work in the channels.

The intake and discharge channel demolition activities will avoid mapped eelgrass beds in the Bay (see Figure BIO-48). Eelgrass plants that may occur in the intake channel work area would not be directly affected by demolition activities, as partial dewatering of the area would retain shallow water over the eelgrass plants. Degradation of the eelgrass could occur if excessive sedimentation from demolition activities in the intake channel cover the eelgrass and channel bottoms. Specific protection and mitigation measures will be developed through consultation with NMFS, US Fish and Wildlife Service, and California Department of Fish and Game, as per the Southern California Eelgrass Mitigation Policy, Revision 11 dated July 31, 2001.

One cluster (containing 4 stands) of estuary seablite (*Suaeda esteroa*), a California Native Plant Society (CNPS) List 1B plant, was found at the intake and discharge channels. Most were growing in isolated patches of coastal salt marsh with *Batis maritime*, *Salicornia virginica*, *and Suaeda taxifolia*, at the water level, while other individuals were growing amongst the rip rap. Two individuals of wooly seablite (*Suaeda taxifolia*), a CNPS List 4 plant, were located at two sites near the intake and discharge channels. Both were found growing on soil in poorly developed isolated patches of coastal salt marsh between boulders of rip rap. In addition, the unlined and tidally influenced portion of Telegraph Canyon Creek that flows to the San Diego Bay supports habitat for the estuary seablite. Demolition of the intake channel headwall and restoration of rip rap shoreline of the intake and discharge channel could result in the loss of individual plants. The plants will be flagged prior to demolition activities and construction personnel will be directed to avoid the plants. If demolition activities require removal of individual plants, they may be relocated to protected areas such as the mouth of

Telegraph Canyon Creek. The Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) would include a more detailed plan to restore, relocate, and/or enhance habitat for seablite along the shoreline.

44. Please describe the Best Management Practices that will be used to minimize sedimentation impacts to marine resources.

Response: As stated in Data Response BIO-42 above, it is anticipated that "soft" barriers will be used to isolate work areas, thus reducing the impact of barrier installation, as well minimizing the impact to the marine environment. These soft barriers are synthetic in nature, and may involve the use of inflatable cofferdams, silt curtains, and gunderbooms. Attachment BIO-42 provides representative information about these barriers. These barriers are typically weighted on the bottom, and will provide a seal on the channel floor. Also provided are Figures BIO-42a and BIO-42b which provides a rendering of the potential use of these barriers. These items may be used singularly or in combination, depending upon whether the work is performed in a wet or dewatered condition, and to remain in compliance with permit requirements. Turbidity monitoring will be performed during intake/discharge channel demolition activities, and rip rap replacement efforts. Turbidity levels, as defined in a forthcoming San Diego Regional Water Quality Control Board 401 water quality certification (as a condition of the USACE Section 404 permit for the project), will be maintained to protect the beneficial uses established for the San Diego Bay. If necessary, water treatment measures would be implemented to reduce turbidity (silt) in construction water. Water treatment measures may include pumping water through a settling tank, silt curtains, or as a last resort, implementing an advanced water treatment system that runs water through a system of weirs and media filters and potentially uses flocculants to settle out any colloidal soil particles.

BACKGROUND

The eastern populations of green sea turtles (*Chelonia mydas agazzizii*) are designated as federally threatened by the United States Fish and Wildlife Service. The South San Diego Bay is the only location on the west coast that supports turtle aggregations. A small population of green sea turtles utilizes the warm effluent from the once-through cooling system of the current South Bay Power Plant. Considering the level of federal protection to green sea turtles, evidence that is more scientific is needed to support the applicant's conclusions that there will be no significant impact to green sea turtle populations.

DATA REQUESTS

45. Since the sea turtles in San Diego Bay use the SBPP area for feeding, please discuss the proximity of the nearest suitable feeding areas. Address how the elimination of the SBPP area feeding grounds in the San Diego Bay would affect survivorship rates.

Response: The San Diego Bay supports eelgrass that provides forage for the green sea turtle. Demolition activities will avoid mapped eelgrass beds in the Bay; however, some eelgrass plants may exist in the intake channel. Demolition of SBPP would not eliminate

eelgrass feeding grounds in the Bay, and significant impacts to eelgrass plants in the intake channel are not expected. This topic will be further addressed in greater detail in the biological assessment being prepared for the National Marine Fisheries Service (NMFS). The effects of the proposed project on the turtle and possible minimization measures will be further developed during formal consultation with NMFS and cooperation with various entities.

46. Please provide a discussion of potential impacts to the green sea turtle population as a whole if the turtle population is adversely impacted.

Response: This subject will be addressed in greater detail in the biological assessment being prepared for the National Marine Fisheries Service (NMFS) in accordance with Section 7 of the federal Endangered Species Act. The effects of the proposed project on the turtle and possible minimization measures will be further developed during formal consultation with NMFS and cooperation with various entities.

BACKGROUND

The applicant has listed a number of permits and consultation documents that will be required from federal and state agencies as they relate to federally listed bird species and green sea turtles, as well as other species of concern.

DATA REQUEST

47. Please discuss the status of a federal Biological Opinion (pursuant to Section 7 of the Endangered Species Act) and a California Department of Fish and Game (CDFG) Consistency Determination. Please provide copies of any correspondence letters and records of conversation with the U.S. Fish and Wildlife Service and CDFG related to this request.

Response: The federal Biological Opinion would be issued by the U.S. Fish and Wildlife Service for potential impacts from construction and demolition noise on special-status birds nesting in salt marsh and salt pond habitats adjacent to the SBPP and SBRP sites. The National Marine Fisheries Service (NMFS) would issue a Biological Opinion for potential impacts to the green sea turtle during demolition activities in the intake and discharge channels, and for the elimination of the warm water discharge to the Bay from the existing SBPP that the turtles have become accustomed to in the Bay. The formal consultation process under Section 7 of the Endangered Species Act will be initiated with USFWS and NMFS by the U.S. Army Corps of Engineers, as the lead federal agency. The Applicant will prepare a biological assessment analyzing potential impacts of the Project on these species. The biological assessment will be submitted to the USFWS and NMFS to review in preparation of their Biological Opinions. The federal nexus for the USACE to initiate consultation would be the permit request under Section 404 of the Clean Water Act (if jurisdictional USACE wetlands are on site), and/or Section 10 of the Rivers and Harbors Act for work within navigable waters (the Bay). Once the federal Biological Opinion(s) are issued, the Applicant will request a consistency determination from California Department of Fish and Game under Fish and Game Code 2080.1 if an incidental take authorization for any state-listed species is necessary. In that case, the CDFG requires 30 days to review and make a determination

that the federal Biological Opinion is consistent with the California Endangered Species Act for any state listed species. Correspondence letters from USFWS are provided as Attachment BIO-47.

BACKGROUND

Eelgrass (*Zostera marina*) beds are a submerged plant community that fringes the south San Diego Bay intertidal zone and are broadly protected as a Special Aquatic Site under Section 404 of the Clean Water Act. Eelgrass provides food and cover for many species of invertebrates and fish, which in turn provide a food base for many bird species, including the federally endangered California least terns. The federally endangered green sea turtle also feeds on eelgrass.

DATA REQUESTS

48. Please include a map detailing the location of eelgrass beds in southern San Diego Bay in the SBPP area.

    Response: Figure BIO-48 provides a map of eelgrass beds that were mapped in South San Diego Bay as part of Duke Energy South Bay Power Plant "SBPP Cooling Water System Effects on San Diego Bay, Volume 1: Compliance with Section 316(a) of the Clean Water Act for the South Bay Power Plant, August 12, 2004".

49. Please describe what mitigation measures would be taken if eelgrass beds cannot be avoided and what would be done to mitigate any temporary or permanent impacts to eelgrass beds from destruction of the headwall.

    Response: No eelgrass occurs in the existing SBPP discharge channel. Eelgrass plants potentially occurring in the intake channel work area would not be directly affected by demolition activities, as partial dewatering of the area would retain shallow water over the eelgrass plants. Degradation of the eelgrass could occur if excessive sedimentation from demolition activities cover the eelgrass plants and the channel bottom. Specific protection and mitigation measures will be developed through consultation with NMFS, US Fish and Wildlife Service, and California Department of Fish and Game, as per the Southern California Eelgrass Mitigation Policy, Revision 11 dated July 31, 2001.

BACKGROUND

The propagation of noise, both above land and below water, has the potential to impact animals. Construction and demolition activities can increase noise levels which have adverse impacts to wildlife including discouragement of foraging, nest abandonment, and decrease in reproductive success. Loud or sustained noises in the underwater environment have the potential to adversely impact marine organisms including fish, marine mammals, and turtles.

DATA REQUESTS

50. Please describe specific types of demolition activities proposed for the marine environment.

    Response: The only demolition activities that would occur in the marine environment are demolition in the intake and discharge channels. These activities are described in the

above Data Responses 42, 43, and 44. There will be a temporary inflatable coffer dam and gunderboom/silt curtains that would isolate the construction activities from the open waters of the Bay marine environment. All other construction would occur within the existing fenceline of SBPP.

51. Please include an estimate of sound levels, attenuation distances, and what, if any, sensitive species (marine and terrestrial) could be impacted from construction of the proposed power plant, the demolition of the existing power plant, and operation of the proposed power plant.

Response: An estimate of sound levels from construction, demolition, and operation is included in the AFC Section 8.2.4.2.2 that was derived from the noise analysis in Section 8.5 of the AFC. The analysis included noise from the activities and operation above ground, which are summarized in Table 8.5-14 on page 8.5-26 of the AFC. Maximum construction noise levels would be at 71 dBA approximately 730 feet west of the SBRP site boundary in the nearest salt pond. Further west into the salt ponds, maximum construction noise levels would be approximately 60 to 63 dBA. Also shown in Table 8.5-14 of the AFC, the predicted noise levels from SBPP demolition and/or SBRP constructions activities at the closest terrestrial habitat nesting area (Location West-c), were calculated to be approximately 56 dBA.

For marine species, there are no known definitive criteria for underwater sound level impacts. Further, as discussed in the responses to Data Responses 42, 43, and 44, noteworthy steps will be taken to physically exclude marine and aquatic species from the vicinity of the demolition areas in the intake and discharge channels. With the following measures, this impact minimization approach, coupled with the inherent mobility of the identified marine species (such as green sea turtles, fish, birds and marine mammals), should preclude significant underwater noise impacts to marine sensitive species:

(a) the intake channel will be dewatered to the extent there will be little, if any, opportunity for underwater generation or propagation of noise during demolition.

(b) the marine animals will be excluded and kept at a distance from the intake and discharge channels demolition activities by the soft barriers used during demolition.

(c) the green sea turtle is not expected to remain in the Bay during the fall/winter months after the SBPP warm water discharge is eliminated in Summer 2008 when SBRP becomes operational.

52. Please discuss both direct and cumulative noise impacts expected to affect biological resources from construction, demolition, and operation activities.

Response: Direct noise impacts on biological resources are discussed in Section 8.2.4.2.2 in the AFC. Operation of SBPP and construction of SBRP would occur simultaneously throughout the construction period. Likewise, operation of the (new) SBRP and demolition of the (existing) SBPP would occur simultaneously. Note, however, that cumulative noise from (SBRP) construction and (SBPP) demolition would not occur.

Existing operation noise levels from SBPP are approximately 65 to 70 dBA at the intake and discharge channels, the closest location of sensitive biological resources (Figure 8.5-4 of the AFC). Maximum SBRP construction noise levels of 59 dBA would occur at the intake channel location. Thus, cumulative noise impacts from SBPP operations and SBRP construction activities at this closest location of sensitive biological habitat are expected to be comparable to existing conditions with the SBPP operating, since the 59 dBA SBRP construction contribution is minimal/negligible in comparison to the existing SBPP operations noise levels of 65 to 70 dBA.

Later in the project, following start-up of the SBRP facility, cumulative noise levels from SBRP operations and SBPP demolition activities are expected to produce noise levels that are dominated by the SBPP demolition activities (see AFC Table 8.5-14 on page 8.5-26) as SBRP operations noise levels at the closest locations of sensitive biological habitat are predicted to be below 45 dBA (see Figure 8.5-6), which is negligible compared to the demolition predictions of 61 to 63 dBA.

Therefore, in both major phases of the project, the proximity of the SBPP plant to the closest locations of significant sensitive biological habitat means that noise levels from activities associated with the SBPP facility, whether it is on-going operations noise or demolition noise (after start-up of the SBRP), are calculated to be the predominant noise sources with little or no contribution from activities at the SBRP site. These predominant noise levels from SBPP activities are summarized in AFC Tables 8.5-10 (page 8.5-20) and 8.5-14 (page 8.5-26).

ATTACHMENT BIO-42

AQUA-BARRIERS™
WATER-INFLATED DAMS

For Immediate Price Quotation
BEGIN HERE

Contact Us
Job Site Photos
Construction Site Dewatering
Sediment Control
Flood Protection
Authorized Representatives
Dimensions & Configurations
Design Characteristics
Stabilization Components
In the News
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Construction Worksite Dewatering Products

Building upon years of industry knowledge and experience, Aqua-Barrier products are designed a manufactured in the United States as the next generation of effective water inflatable cofferdams use in the construction industry... as dependable liquid inflatable containment structures for contr hazardous materials on land and in the marine environment.... as well as some of the fastest and easiest to deploy flood fighting and flood mitigation tools available anywhere.

How are Aqua-Barriers made?

Aqua-Barriers are constructed from industrial grade vinyl coated polyester. This fabric is laminate with
a base of woven polyester between two layers of flexible polyvinyl chloride. These units can be repaired easily in the field in wet or dry conditions, are reusable and provide for compact storage, transportation and ease of handling.

What sizes of Aqua-Barriers are available?

Inflated heights are 2-, 3-, 4-, 5-, 6-, 7- and even 8-ft. Standard lengths are 25-, 50-, and 100-ft. Custom sized units are available upon request.

Aqua-Barrier Connections

Aqua-Barriers are joined together using an easy-to-deploy barrier overlapping technique describe below.

Each inflated Aqua-Barrier section is straight without the ability to bend. When joining Aqua-Barri sections, an overlapping technique is used. Place the barrier to be inflated on top of the end of th inflated barrier and begin the installation process. The amount of overlap is determined by height indicated in the chart below:

Aqua-Barrier Inflated Height (ft)	Overlap Length (ft)

2	3
3	4.5
4	6
5	7.5
6	9
7	10.5
8	12

How does an Aqua-Barrier work?

The concept is a simple one that's backed up by the latest in high-tech design and fabrication techniques. Aqua-Barriers are constructed as single tubes with a patented inner restraint diaphra running the length of each unit.

This is the basic structural element that prevents them from rolling when exposed to unequal wat hydrostatic pressures from the outside.

A noticable feature on Aqua-Barriers are the industrial grade threaded fittings used as fill and dra ports on each unit. Manufactured from rigid PVC and available in 4- and 8-inch diameter, these p are conveniently installed on the top of all Aqua-Barriers. The 8-inch drain ports are installed alor sides and ends.

Using standard size hose and adapters the installation and removal of an Aqua-Barrier coffer dar containment structure or temporary flood wall is quickly and easily accomplished. When filled to t recommended height these mass and gravity-based units are able to conform to various types of terrain and stream bed materials. The flexibility and impermeability of a vinyl Aqua-Barrier create effective water-tight seal which then allows for the removal, diversion or deflection of surface, floc contaminated waters.

How are Aqua-Barriers installed?

Technical assistance and installation consultation are available from a network of authorized Aqu Barrier trained professionals. As easy as this product is to install, there are minimum site specific requirements. Slope and grade parameters, water depth, water velocity, anticipated water flows a related hydrological standards must be evaluated before applications can be undertaken. When correctly installed, Aqua-Barrier inflatable dams provide effective, affordable protection for waterv property and people.

To properly evaluate your particular worksite dewatering project, complete and return an Aqua-Ba Work Site Assessment.

What are the standard heights and dimensions of Aqua-Barriers?

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Hydro-Solutions, Inc.
WATER-INFLATED DAMS

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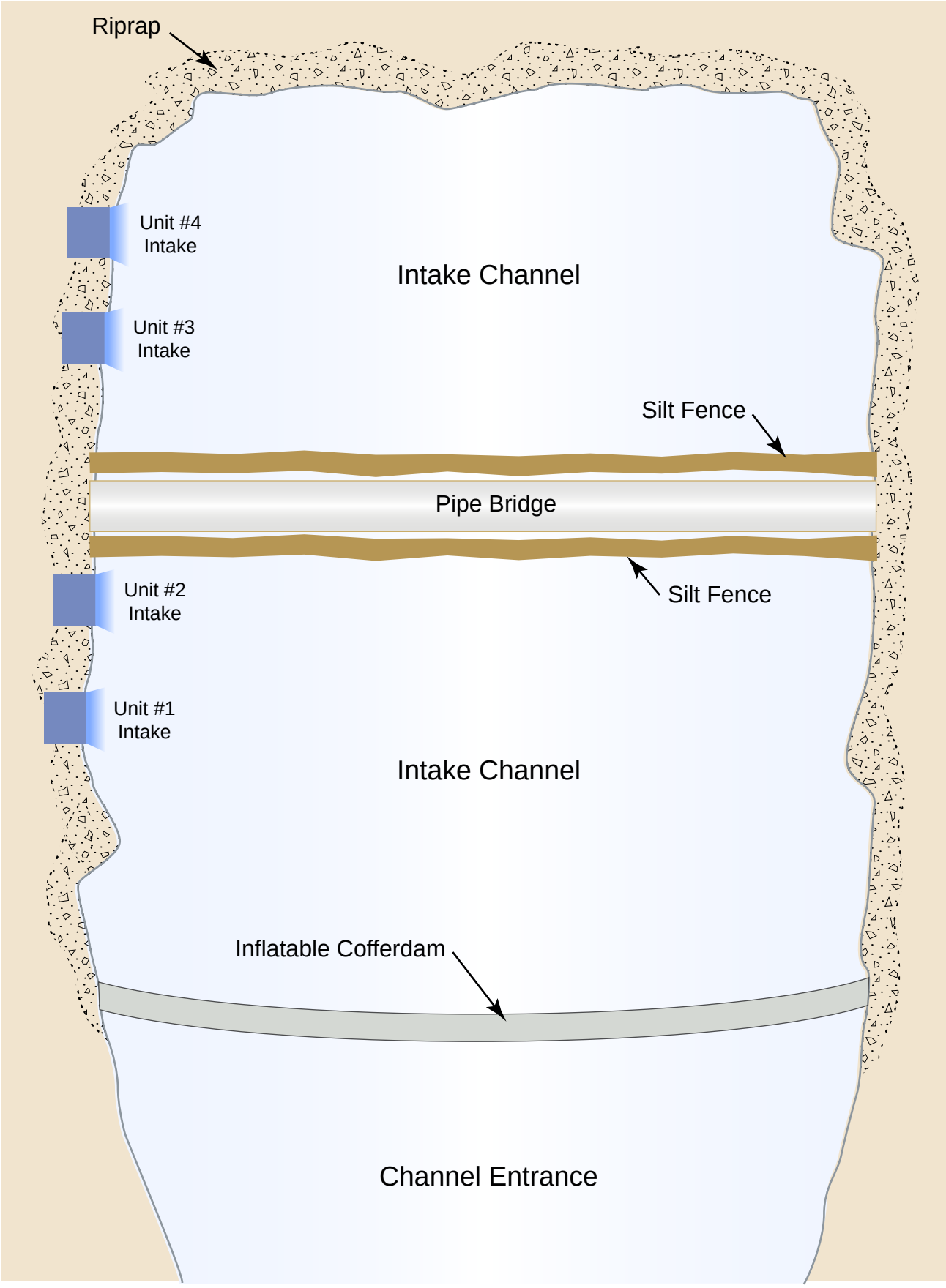

FIGURE BIO-42a
Intake Channel Plan
South Bay Replacement Project

CH2MHILL

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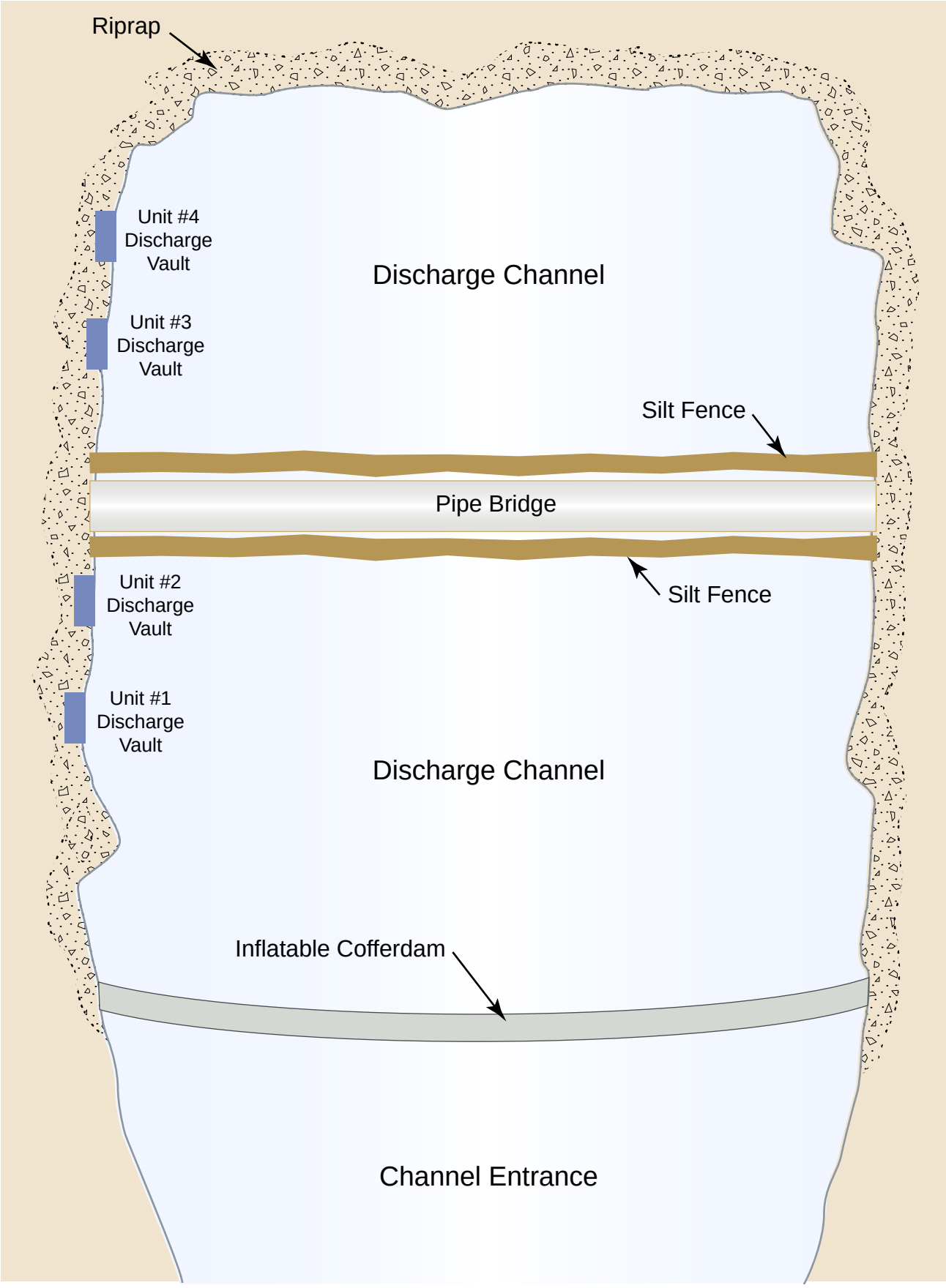

FIGURE BIO-42b
Discharge Channel Plan
South Bay Replacement Project

CH2MHILL

CS112006001SCO334533.TM.TA.DE SBPP_02.ai 11/06

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92011

In Reply Refer To:
FWS-SDG-4943.2

AUG 14 2006

DOCKET
06-AFC-3
DATE AUG 14 2006
RECD. AUG 15 2006

Bill Pfanner, Project Manager
California Energy Commission
1516 9th Street, MS-15
Sacramento, CA 95814

Subject: Comments on the Application for Certification for the LS Power Generation LLC Proposed South Bay Replacement Project

Dear Mr. Pfanner:

The U.S. Fish and Wildlife Service (Service) has received the Application for Certification dated June 30, 2006 (Application) submitted to the California Energy Commission (CEC) for the LS Power Generation LLC (Applicant) Proposed South Bay Replacement Project. The proposed project involves the construction and operation of a new energy facility, the South Bay Replacement Project (SBRP), the decommissioning and demolition of the existing South Bay Power Plant (SBPP), and the construction of a San Diego Gas and Electric substation adjacent to the SBRP site. The Application was forwarded to the Service as part of the CEC's review process.

The CEC requested the Service provide comments regarding disclosure in the Application of potential issues with the project by July 28, 2006. Because we did not receive the Application until July 25, 2006, we committed instead, in an electronic mail message dated July 28, 2006, to providing comments by August 14, 2006. This letter contains a list of the Service's major concerns regarding the proposed project, and, as requested by the CEC, a list of potential issues that were not identified in the Application.

Prior to receiving the Application, the Service submitted a letter dated July 18, 2006, to CH2M HILL, the biological consultant for the proposed project. This letter included general information and recommendations to aid project proponents in avoiding and/or minimizing project impacts to biological resources. A copy of this letter was sent to the CEC on July 28, 2006, to provide preliminary comments on the Application, and is also enclosed with this letter.

The project site is located in the City of Chula Vista, on the southeastern shore of San Diego Bay

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(Bay) within an area containing a number of sensitive natural habitats and wildlife species. It is adjacent to the Bay, J Street Marsh, and the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (SDB NWR) and is attached to the Chula Vista Wildlife Reserve. It is also near the Sweetwater Marsh Unit of the SDB NWR. These areas provide habitat for a number of federally listed and State listed species, and migratory birds. As such, the Service is concerned with the issues listed below (see enclosed July 18, 2006, letter for further discussion):

- Avian collisions
- Increased predation
- Water temperature change in the vicinity of the effluent channel
- Noise
- Lighting
- Landscaping
- Runoff
- Buffers between project site and sensitive biological areas (i.e., San Diego Bay NWR, J Street Marsh)
- Preventing access to the SDB NWR
- Dust, soil erosion, and siltation
- Shading
- Project footprint
- Turbidity due to in-water construction activities (e.g., pile driving or jetting, dredging, demolition, placement of fill)
- Fill/dredging
- Water quality
- Measures to avoid, minimize, and offset (i.e., mitigate) impacts to biological resources

Most of the general issues of concern listed above were identified in the Application; however, the following specific points were not identified that need to be addressed by the Applicant and the CEC:

- Potential for avian collisions with windows or other clear glass or reflective surfaces
- The possibility of predators to ground nesting birds being attracted to refuse on the proposed site if waste containers do not have lids that are fitted and that stay closed
- Vegetation to be planted in the 100-foot buffer area along the western edge of the project site

- Effects of removing non-native grassland habitat (used as by a number of species for foraging and cover)
- Measures to ensure that there will be no access into the SDB NWR from the project site at any time
- Measures to minimize shading effects of new facilities on adjacent wetland and other habitat resources
- Effects of shockwaves/noise from in-water demolition activities on biological resources
- Effects of equipment used for headwall demolition on water quality
- Measures to prevent runoff in the storm water drainage channel from entering salt ponds adjacent to the site

Thank you for the opportunity to review the Application. We look forward to providing further comments on the proposed project and hopefully resolving all issues of concern to the Service. Should you have any questions regarding the information in this letter, please contact Ayoola Folarin of my staff at (760) 431-9440.

Sincerely,

Therese O'Rourke
Assistant Field Supervisor

cc: Bob Hoffman, NOAA-NMFS
John H. Roberts, SDRWQCB
Andy Yuen, San Diego Refuge Complex
Brian Collins, San Diego Refuge Complex
Victoria Touchstone, San Diego Refuge Complex
Marilyn Fluharty, California Department of Fish and Game

Enclosure (1)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road
Carlsbad, California 92011

In Reply Refer To:
FWS-SDG-4943.1

Jul 18 2006

Dr. G. O. Graening
Senior Biologist
CH2MHill
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833

Subject: Request for List of Federally Listed Species and Guidance for Pre-Project Biological Analysis – LS Power's South Bay Replacement Project Proposed Project

Dear Dr. Graening:

The U.S. Fish and Wildlife Service (Service) has received your letter dated, May 11, 2006, in which you requested a list of species with federal status occurring on or in the vicinity of the proposed project site. In your letter, you also requested guidance to help focus your biological analyses in preparation for a possible formal consultation with the Service pursuant to section 7, or habitat conservation plan pursuant to section 10 of the Endangered Species Act (Act) of 1973, as amended.

The proposed project site is located in the South Bay area of the City of Chula Vista, on the southeastern shore of San Diego Bay (Bay). The project involves the construction of a new energy facility, and the decommissioning and demolition of the existing South Bay power plant.

The project site lies within an area containing a number of sensitive natural habitats and wildlife species. It is adjacent to the Bay, J Street Marsh, the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (SDB NWR) and is attached to the Chula Vista Wildlife Reserve (see attached figure). It is also near the Sweetwater Marsh Unit of the SDB NWR. These areas provide habitat for a number of federal and state listed species and migratory birds.

To assist you in evaluating whether or not the proposed project may affect listed species, we are providing the attached list of federally listed species that occur in the general project area. A number of State-listed species and California Species of Special Concern are also known to

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inhabit the natural habitat areas near the project site. You should contact the California Department of Fish and Game for State-listed and sensitive species that may occur in the area of the proposed project if you have not already done so. Please note that State-listed species are protected under the provisions of the California Endangered Species Act.

The biological analysis for this project should address the project's direct, indirect, and cumulative impacts, and alternatives to avoid and/or minimize these impacts, on the biological communities associated with J Street Marsh, the South San Diego Bay and Sweetwater Marsh Units of the SDB NWR, the Chula Vista Wildlife Reserve, the shoreline and near-shore waters of San Diego Bay, and on the project site. Measures to mitigate unavoidable impacts should also be proposed. All facets of the project (e.g., construction, implementation, operation) should be included in this analysis. The following information and recommendations should be considered when conducting the biological analysis, and incorporated into the project design to avoid and/or minimize project impacts on biological resources:

1. Bird Strikes
   The project site is located in an area that experiences significant bird migration activity. A map showing potential migration corridors through and/or adjacent to the project site should be created as part of the biological analysis. To minimize the potential for bird strikes, we recommend that any tall structures be located away from the Bay and outside the flight-path of migratory birds. In addition, the use of glass or other reflective surfaces on the power plant and associated support structures should be avoided. If the use of glass is proposed on associated buildings within the site, only non-reflective glass in combination with other appropriate measures (e.g., glass etching, decals) should be used to avoid bird collisions.

   To determine if these measures are adequate, we recommend that monitoring for bird strikes be implemented post construction. If there is evidence that bird strikes are occurring, then additional measures should be incorporated to reduce these impacts.

2. Predators
   The proposed development could lead to increased predation levels to State and federally listed species due to increased predator perches and increased food from trash acting as attractants to generalist predators. We recommend that permanent measures (e.g., nixalite) be incorporated to avoid introduction of predator perches on buildings, signs, lighting fixtures, and landscaping with a line of site into any of the surrounding wildlife habitat areas to reduce the potential for take of sensitive wildlife by avian predators. We also recommend interim measures be used on construction cranes and equipment.

   Refuse on site may attract predators such as predatory birds (i.e., corvids and gulls), ants, and rats and other mammals that can prey on endangered species' chicks and eggs. All trash receptacles present on the site, including dumpsters and small containers, should be

of a design that ensure the lids are secured at all times except when trash is being disposed into them. This is necessary to reduce the potential for predatory species to congregate around trash receptacles or otherwise populate the site.

3. Water Temperature
It is our understanding that as the existing power plant on the proposed site is decommissioned, the warm water currently returned to the Bay from the plant will gradually be reduced until warm water is no longer returned to the Bay. The current conditions around the discharge water outlet should be determined as part of the biological analysis for the proposed project. The project proponents should be prepared to detail the plan for carrying out the reduction of warm discharge water (e.g., at what rate the return water will be reduced and the area returned to ambient Bay temperature).

The biological analysis should also determine what effects the reduction will have on the Bay's flora and fauna. For instance, it is theorized that the warm discharge water from the existing power plant has created a hospitable warm water environment for the federally listed green sea turtle (*Chelonia mydas*). Removing the discharge water could thus have an impact on the green sea turtles that inhabit the Bay. The biological analysis should address anticipated impacts to green sea turtles (e.g., if they are expected to relocate and if so, where to; the current condition of the habitats to which they may relocate; and if no negative impacts are anticipated, why not). We recommend working closely with National Marine Fisheries Service on the green sea turtle matter.

We recommend a multi-year post-construction study to monitor changes in the flora and fauna of South Bay resulting from the proposed project.

4. Noise
Potential noise impacts to wildlife, particularly during the breeding season and peak migration periods, could result from construction and demolition activities. Increases in existing noise levels during and after construction within and adjacent to the study area should be avoided or minimized. If necessary, excessive temporary or permanent noise levels beyond the property line should be reduced through appropriate design features.

5. Lighting
Artificial night lighting disrupts important behaviors and physiological processes with significant ecological consequences, including the disorientation of birds during migration. The proposed project should only use night lighting necessary for human safety. All lighting should be low intensity and should be fully shielded and directed downward. No 'vanity lighting' or any other type of lighting that could result in glare or sky glow should be permitted. No lighting from this project should be permitted to fall outside the project boundaries or on any proposed habitat buffer areas. We also recommend a requirement that windows be treated to prevent indoor light from shining through them to help reduce sky glow. Parking lots should be designed or screened so that

the headlights of vehicles parked at night do not shine into adjacent wetlands or other habitat areas.

6. Landscaping
Project landscaping should include only native plant species, and not include exotic plant species that may be invasive to adjacent native habitats. Exotic plant species not to be used include those species listed on Lists A & B of the California Invasive Plant Council's (Cal-IPC) list of "Exotic Pest Plants of Greatest Ecological Concern in California as of October 1999." This list includes such species as pepper trees, pampas grass, fountain grass, ice plant, myoporum, black locust, capeweed, tree of heaven, periwinkle, sweet alyssum, English ivy, French broom, Scotch broom, and Spanish broom. A copy of the complete list can be obtained from Cal-IPPC's web site at http://www.cal-ipc.org. In addition, landscaping should not use plants that require intensive irrigation, fertilizers, or pesticides

To avoid the provision of perching sites for avian predators, landscaping should not include tall trees such as palms that would provide avian predators with a line of site into any of the surrounding wildlife habitat areas.

The Service also recommends removal of exotic species currently on the project site and in the proposed buffer area.

7. Runoff
Water runoff from landscaped areas should be directed away from the Bay and the buffer area and contained and/or treated on the project site. Runoff from the project site should also be prevented from entering the pond system located adjacent to SDB NWR (see attached figure). The drainage channel between the project site and ponds 29 and 28 has breeched in the past, allowing runoff from the site to enter these ponds. These ponds are proposed for tidal restoration and will most likely support migratory birds in the future. Therefore, runoff and other impacts to the pond system should be avoided.

8. Buffer
Adequate buffers should be designed in between sensitive biological areas (i.e., San Diego Bay NWR, J Street Marsh) and the project site to protect sensitive habitats. The buffer should be a minimum of 100 feet wide and be free of all project infrastructure (e.g., erosion control devices, fences, brush management, and trails). The buffers should be located immediately adjacent to the habitat areas. To prevent human and mammalian access into buffer areas, there should be fencing or another suitable barrier system at the outside edge of the habitat buffer prior to the initiation of project construction. No activities recreational or otherwise, should be proposed within the buffer areas.

We recommend that landscaping within the buffer utilize only appropriate locally native species to conserve water, minimize pollutant discharge into wetlands, and minimize the

use of fertilizers and pesticides. No trees should be planted in the buffer adjacent to the SDB NWR, these would act as predator perches. Each habitat buffer should be maintained and monitored for five years or until success criteria, developed in coordination with the Service, are met.

9. Access to the SDB NWR
   Steps should be taken to ensure that there will be no access into the SDB NWR from the project site at any time.

10. Dust, Soil Erosion, and Siltation
    Measures should be provided to minimize the effects of excessive dust, soil erosion, and siltation on adjacent sensitive habitats (e.g., J Street Marsh, buffer area, SDB NWR, and ponds 28 and 29). The quality of habitat within these areas could be degraded if dust and silt are permitted to accumulate as a result of wind and water action during construction.

11. Shading
    The project should be designed to minimize shading effects of buildings on adjacent wetland and other habitat resources.

12. Project Footprint
    The proposed project site is located on 19.4 acres of previously developed land just south of the existing power plant. The footprint of the new power plant should be restricted to the developed area as planned and not expand into adjacent habitats.

If any construction/demolition activities are to take place within the Bay:

13. Turbidity
    In-water construction activities (e.g., pile driving or jetting, dredging, demolition, placement of fill) can reduce the ability of sight-foraging birds, such as the least tern and brown pelican, to see and catch their fish prey in the water column. Decreases in light penetration can also decrease photosynthesis by phytoplankton, kelp, and eelgrass; increased turbidity may also negatively impact green sea turtles. Shock waves and noise from demolition and pile driving may further impact marine organisms. The biological analysis should determine what measures would need to be taken to reduce impacts caused by any in-water construction activities that may take place as part of the proposed project. In-water construction activities should not occur during the least tern (*Sterna antillarum browni*) breeding season (April 1 – September 15).

14. Fill/Dredging
    The biological analysis should determine the cubic footage and depth of anticipated fill or dredging, and detail any anticipated changes to Bay habitats [i.e., intertidal habitat (+7.8 feet to -2.2 feet MLLW); shallow subtidal habitat (-2.2 to -12 feet MLLW); medium subtidal habitat (-12 feet MLLW to -20 feet MLLW); and open water habitat].

15. Water Quality
    Depending on the physical and chemical characteristics of the dredge material, dredging could result in the resuspension and redistribution of sediments and increased exposure of chemical contaminants to marine resources. Construction equipment may impact water quality by releasing petroleum products, sewage, litter, cleaning agents, and other toxic materials into marine waters. The biological analysis should evaluate contamination of any sediment to be dredged and other impacts to water quality in the Bay and adjacent wetlands including runoff during and after construction.

16. Eelgrass Mitigation
    Impacts to eelgrass (*Zostera marina*) vegetated areas, which are recognized as important ecological communities in shallow Bays and estuaries because of their multiple biological and physical values, should be evaluated and mitigated in accordance with the Southern California Eelgrass Mitigation Policy (revision 10).

Should you have any questions regarding the species on the enclosed list, your responsibilities under the Act, or any other information in this letter, please contact Ayoola Folarin of my staff at (760) 431-9440.

Sincerely,

//s//David Zoutendyk, for
Therese O'Rourke
Assistant Field Supervisor

cc: Debra Crowe, CH2MHILL
Bob Hoffman, NOAA-NMFS
John H. Roberts, SDRWQCB
Andy Yuen, San Diego Refuge Complex
Brian Collins, San Diego Refuge Complex
Victoria Touchstone, San Diego Refuge Complex
Marilyn Fluharty, California Department of Fish and Game

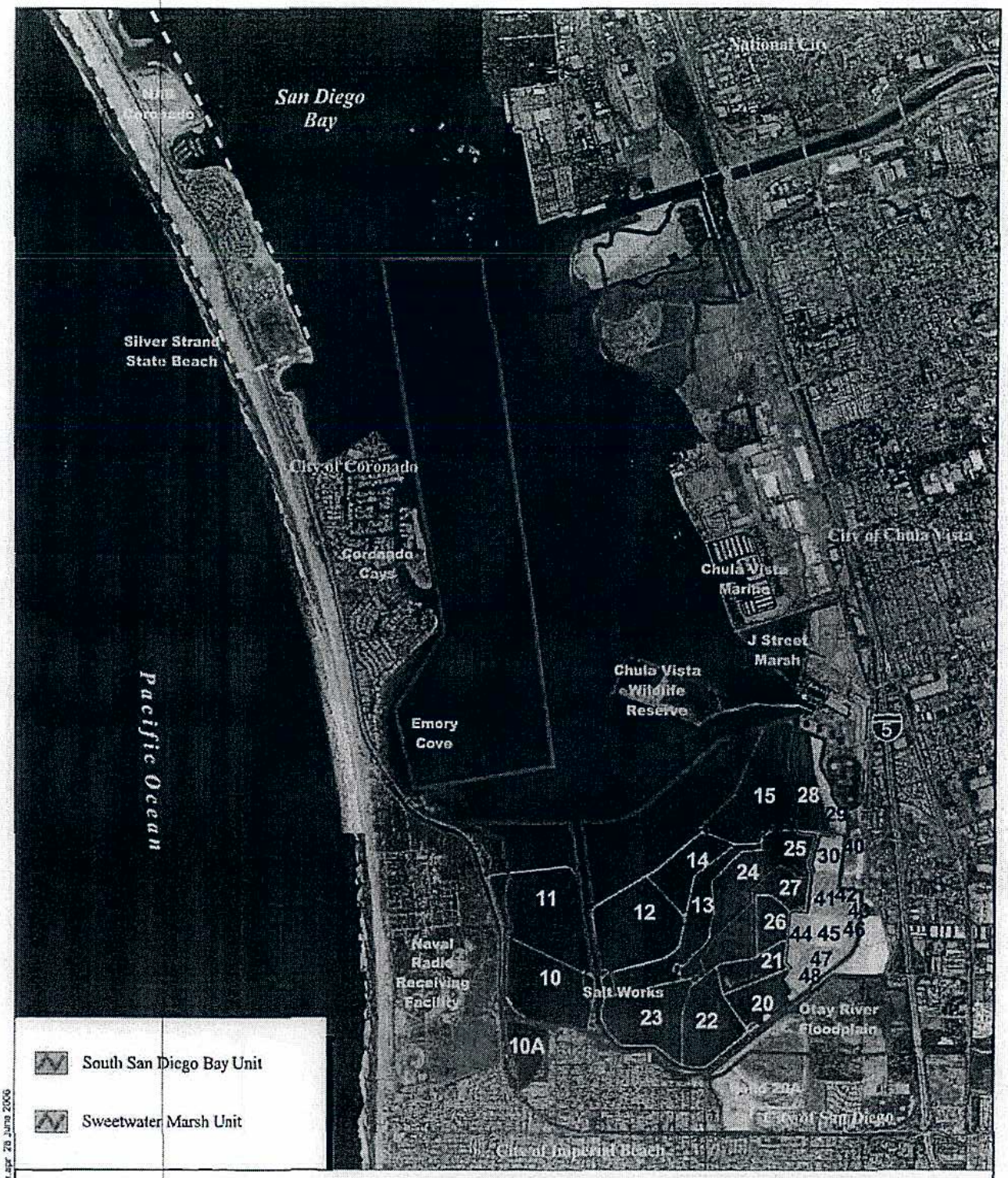
Enclosure

Listed Endangered, Threatened
and Proposed Species that may occur in South Bay

Common Name	Scientific Name	Status
BIRDS		
western snowy plover	*Charadrius alexandrinus nivosus*	T
California least tern	*Sterna antillarum browni*	E
brown pelican	*Pelecanus occidentalis*	E
California gnatcatcher	*Polioptila californica californica*	T
light-footed clapper rail	*Rallus longirostris levipes*	E
REPTILES		
Pacific green sea turtle*	*Chelonia mydas*	T
PLANTS		
salt marsh birds beak	*Cordylanthus maritimus* ssp. *maritimus*	E

*Under the jurisdiction of the National Marine Fisheries Service

T=Threatened
E=Endangered



San Diego Bay National Wildlife Refuge and Surrounding Resource Areas

0 0.25 0.5 Miles

Source: USFWS, Local Agency Partnership 2000 (2 ft imagery)

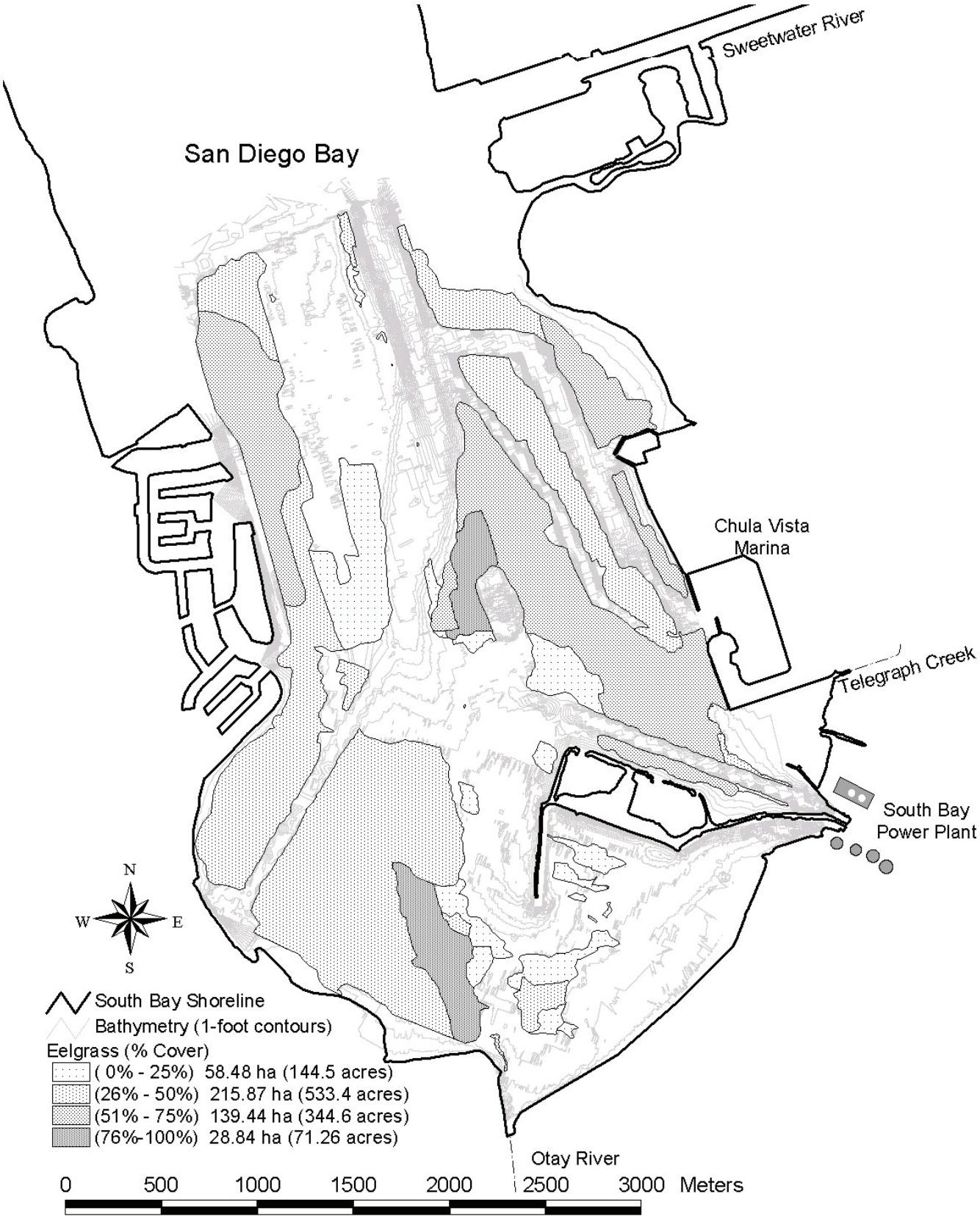
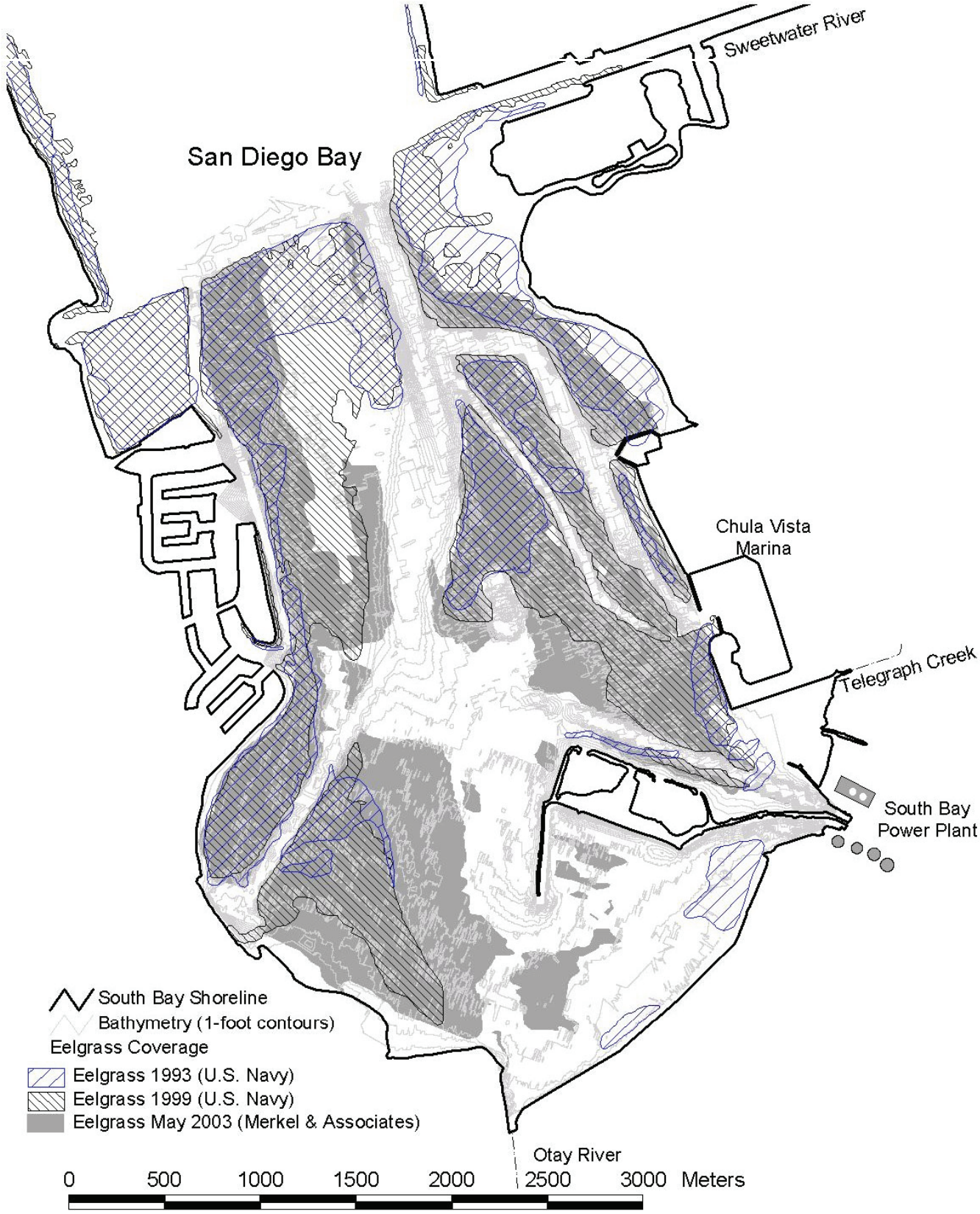


FIGURE BIO-48a
EELGRASS COVERAGE IN SOUTH BAY, MAY 2003
SOUTH BAY REPLACEMENT PROJECT
CHULA VISTA, CALIFORNIA

SOURCE: Duke Energy South Bay Power Plant, SBPP Cooling Water System Effects on San Diego Bay, Volume 1: Compliance with Section 316(a) of the Clean Water Act for the South Bay Power Plant, August 12, 2004.



SOURCE: Duke Energy South Bay Power Plant, SBPP Cooling Water System Effects on San Diego Bay, Volume 1: Compliance with Section 316(a) of the Clean Water Act for the South Bay Power Plant, August 12, 2004.

FIGURE BIO-48b
COMPARISON OF EELGRASS COVERAGE IN SOUTH BAY (1993, 1999, 2003)
SOUTH BAY REPLACEMENT PROJECT
CHULA VISTA, CALIFORNIA

CH2MHILL

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SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Cultural Resources
Author: Beverly E. Bastian

BACKGROUND

The design of the proposed South Bay Replacement Project (SBRP) would include the underground installation of various transmission lines and plant utilities. In addition, a new stormwater retention basin will be constructed, possibly by excavation. Excavation dimensions and methods were provided in the AFC for some of these structures, but not for others. Staff needs to know the dimensions and excavation methods of the required excavations to assess their potential impacts on possible buried cultural resources.

General Data Response 53: The SBRP site will be filled such that it is above the 100-year flood plain elevation. The average final elevation of the site is at 23 feet above sea level. The existing base elevation of the site ranges from 10 feet to 19 feet above mean sea level, with existing earthen berms to over 25 feet above mean sea level. The low point of the final elevation, the bottom of the stormwater detention basin, is at 16 feet (existing elevation in the area of the basin is 11-13 feet). The average existing base elevation of the site is approximately 16 feet and the average fill is 7 feet.

DATA REQUESTS

53. Please provide the width and depth of the trench or trenches for the underground 230 kV loop-in from the Otay Mesa Power Purchase Agreement Transmission Project line to the interim 230 kV substation.

    Response: See General Data Response 53. Trench width will typically be 42 inches or less, and trench depth will typically be 5 ft, though it will vary between 4 ft and 8 ft depending upon underground obstructions.

54. Please provide the depth of the holes for the two supports (H-frame structure and single pole structure) of the 230 kV overhead interconnection between the proposed new steam turbine generator step-up transformer and the proposed new 230 kV substation.

    Response: See General Data Response 53.The depth of the holes for the H-frame structure foundations will be approximately 18 feet and the depth of the hole for the single pole structure will be approximately 20 feet.

55. Please provide the location, depth, and excavation method of the excavations for splice boxes, if any, for all underground transmission lines.

    Response: See General Data Response 53. For the interim configuration, one splice box is identified on Figure 5.2-3 of the AFC with the designation "Manhole" in the plan view. This manhole will contain splices for both the 69 kV and 138 kV circuits. It will be approximately 21 ft long x 11 ft wide x 9 ft high with approximately 2 ft of earthen cover. This manhole will require an 11 ft deep hole which will be excavated by backhoe.

    No splice boxes are required for the 69 kV or 138 kV circuits in the final configuration. It is anticipated that SDG&E will install two additional manholes in their easement

immediately east of the SBRP site for the 230 kV circuit. These manholes are anticipated to be of equivalent size and depth as stated above.

56. Please provide the depth and excavation method of the excavation required for the underground piping and pigging facilities for the natural gas metering station.

Response:

See General Data Response 53. Within the 300-foot SDG&E easement that runs parallel to the west side of Bay Blvd., the existing grade ranges from 16 feet to 24 feet above mean sea level. As part of the SBRP project, there are no plans to change the ground surface elevation within the 300-foot-wide SDG&E easement, except for disturbances as noted herein.

The natural gas metering station is above ground. For piping to and from this station an excavator will be used to dig a trench 3′ to 6′ deep. Because the entire SBRP site is largely on fill that will be imported to the site as part of the construction of the SBRP, impact to soils below existing grades will be minimal.

57. Please provide the excavation method and the depth of the trench for the potable water supply pipeline.

Response: See General Data Response 53. An excavator will be used to dig a trench 3′ to 6′ deep. Because the entire SBRP site is largely on fill that will be imported to the site as part of the construction of the SBRP, impact to soils below existing grades will be minimal.

58. Please provide the excavation method and depth of the trench for the waste water disposal pipeline.

Response: See General Data Response 53. An excavator will be used to dig a trench 3′ to 6′ deep. Because the entire SBRP site is largely on fill that will be imported to the site as part of the construction of the SBRP, impact to soils below existing grades will be minimal.

59. Please provide the greatest depth of the excavation necessary to create the stormwater retention basin.

Response: See General Data Response 53. An excavator will be used to dig the stormwater detention basin. The finished grade bottom elevation of the basin is designed at elevation 16′. Existing grade in the area of the stormwater detention basin is less then elevation 15′ (except in areas of the existing berm); therefore impact to soils below grade will be minimal.

BACKGROUND

The AFC (p. 2-3) refers to a 300-foot-wide existing SDG&E utility easement running along the entire east side of the parcel on which the proposed SBRP would be built and, apparently, extending north to K Street, where the proposed natural gas pipeline for the project would tie in to an existing SDG&E gas line. The AFC describes the easement as disturbed ground. The AFC also states that the proposed SBRP site, the existing South

Bay Power Plant (SBPP) site, and the proposed appurtenant linear facility routes were surveyed for cultural resources on February 14, 2006. From the AFC, it is not clear that the easement was surveyed, and no information was included detailing the nature and extent of ground disturbance in the easement. To determine whether construction activities proposed within the easement could affect cultural resources, staff needs to clarify whether this easement has been surveyed for cultural resources within the past five years and what is the nature and extent of the ground disturbance in the easement.

DATA REQUESTS

60. Please provide the personnel names and qualifications, methods, and findings for the cultural resources survey of the entire north-south length of the 300-foot-wide SDG&E utility easement, within which the natural gas pipeline for the SBRP would be installed. If this easement has not been surveyed for cultural resources within the past five years, please complete the required survey and provide personnel names and qualifications, methods, and findings.

    Response: The alignment for the gas pipeline route was subject to 100 percent cultural resources survey using 15-meter parallel transects by Clint Helton of CH2M HILL on February 14, 2006. The proposed gas line alignment was surveyed concurrent with the rest of the project area. Much of the ground surface was visible, and the alignment falls within heavily disturbed soils. Mr. Helton's qualifications are included in Section 8.3.1 of the AFC, and his resume is included in Appendix 8.3A of the AFC.

61. Please provide a discussion of the nature and extent of ground disturbance in the 300-foot-wide existing SDG&E utility easement.

    Response: The entire area, including the 300-foot-wide existing SDG&E easement has been heavily disturbed by construction of the existing electrical transmission lines within the easement, and by construction of the existing South Bay Power Plant as well as the construction and demolition of liquefied natural gas (LNG) storage tanks (no longer present). As part of the SBRP project portions of SDG&E's300-foot-wide easement will be subject to additional disturbance to construct two access roads for the SBRP site, and to install the gas line, potable water line, and waste-water discharge line to service the plant.

BACKGROUND

The AFC does not provide location information on the route of the natural gas supply pipeline from the metering station to the two combustion turbines. Staff needs this information to identify all ground-disturbing project activities and assess their potential to impact buried cultural resources.

DATA REQUEST

62. Please provide a map showing the route of the natural gas supply pipeline from the metering station to the two combustion turbines and indicate the required trench depth of this line.

    Response: The trench for the gas line will be 3′ to 6′ below finish grade. Because the entire SBRP site is largely on fill that will be imported to the site as part of the

construction of the SBRP, impact to soils below existing grades will be minimal. A figure identifying the route of the natural gas supply pipeline from the metering station to the two combustion turbines is provided as Figure CUL-62.

BACKGROUND

In its review of applicable laws, ordinances, regulations, and standards regarding cultural resources, the AFC indicates that San Diego County has an ordinance (San Diego County Administrative Code, §396.7), which establishes a San Diego County Local Register of Historical Resources. The AFC does not indicate that, during routine archival research to identify cultural resources in the project area, this local register was checked.

DATA REQUEST

63. Please check the San Diego County Local Register of Historical Resources for any listings located within one mile of the proposed project and provide the results.

Response: Gail Wright (858-694-3003), Planner II for San Diego County, was contacted by telephone on November 13, 2006, and the current list of properties in the register was reviewed by Clint Helton of CH2M HILL. None of the properties listed in the San Diego County Local Register of Historical Resources fall within one-mile of the South Bay Replacement Project.

BACKGROUND

The April, 2006, Geotechnical Foundation Analysis for the proposed SBRP (Appendix 8.15A) reports that there may be five to ten feet of surface fill material on the site, and that the potential of this material for liquefaction and for excessive settlement indicates that shallow foundations are not feasible for heavily loaded and settlement-sensitive structures. The earlier report of Black and Veatch to Duke Energy recommended that fill material at the LNG site be removed and replaced with structured and compacted fill because of these stability issues (Appendix 8.15A, July 27, 2005). The AFC does not indicate whether this would be done. Nor does it identify any off-site disposal or borrow areas, if the removal and replacement would be done. To identify all impacts of the proposed project, staff needs to know if fill removal is planned and if the chosen soil disposal and borrow sites have been surveyed for cultural resources.

DATA REQUESTS

64. If surface fill material will be removed from the LNG site, please identify where this removal would be done, and how deep the fill removal would go in each location targeted for fill removal.

Response: The existing berm will be removed, however all fill material will remain onsite. It is approximately 10′ to 12′ high and will be cut down to existing grade and used as fill material for the site. The remainder of the site is in fill, but the existing surface will be prepared by scouring vegetation and loose topsoil.

65. If removed fill material will be disposed of off-site and/or new fill soils brought in, please provide reports of the dates, personnel, methods, and findings from any cultural resources surveys of the disposal and borrow sites, or explain why no surveys are needed. If disposal and borrow sites are not commercial operations and consequently have not been surveyed for cultural resources, please conduct such surveys and provide the personnel qualifications, methods, and findings.

Response: Fill material will remain onsite. The site will be filled above the existing grade by the use of imported fill. The existing onsite berm will provide approximately 4,000 cubic yards of fill material. As discussed in Section 2.3-15.4 of the AFC, it is expected that approximately 165,000 cubic yards of fill material will be required for the construction of the site. During the construction timeframe of the project (i.e., 2008 to 2009), it is believed that quality fill material will be available in the San Diego area from Caltrans projects, San Diego County Water Authority (SDCWA) projects, and other local projects. It is likely that Caltrans projects will have fill material available during the planned construction timeframe for SBRP. SDCWA has 5 major projects that will be ongoing during 2008 and 2009. The combined Caltrans and SDCWA projects that will be ongoing in the 2008 and 2009 timeframe in the San Diego area are expected to provide the required filled material for the construction of the SBRP. As public projects that will be subject to CEQA review, it is reasonable to expect that appropriate cultural resource surveys will be conducted for these Caltrans and SDCWA projects and that appropriate cultural resource mitigation measures will be implemented for these projects.

BACKGROUND

The Herbert and Walters historical architectural study of the extant SBPP briefly discusses the former SDG&E LNG storage facility to the south, on the site where the applicant proposes to build the new SBRP. The study indicates that the LNG facility was completed in 1965, was the only such facility in the west, and was one of only five in the world at the time (AFC Appendix 8.3C, pp. 9, 13). The age and the distinction of the LNG facility indicate that it must be considered a cultural resource potentially eligible for the California Register of Historical Resources (CRHR) under Criterion A and possibly under Criterion C, as well. To ensure that staff has a complete inventory of significant cultural resources which could be significantly impacted by the proposed SBRP, the remains of the LNG facility must be recorded and evaluated.

DATA REQUEST

66. Please record the remains of the LNG facility (foundations, roads and all other paved areas, tanks pads, and berms) as a historical archaeological site on DPR 523 forms, and provide a copy to both staff and the California Historical Resources Information System (CHRIS). Also, please have the former facility researched and evaluated for eligibility for the CRHR by a historian knowledgeable in the field of energy technology development and incorporate his or her report of the facility's historical context and significance into the DPR 523 forms.

Response: Mr. Rand Herbert of JRP Historical Consulting conducted a separate field reconnaissance of the visible remains of the LNG facility components on November 16,

2006. A DPR 523 form is in preparation and will be provided to the CEC in a separate docket filing when the form and eligibility determination is complete (expected to be completed in December 2006). Mr. Herbert has inventoried and evaluated a wide range of energy production facilities, including hydroelectric powerhouses, gas/oil steam turbine stations, substations, and transmission lines. He has also studied dams, canals, control equipment, and other appurtenant structures. In these studies he has placed the resources in question in the context of energy development in California. Mr. Herbert's resume is provided as Attachment CUL-66.

BACKGROUND

The information from the CHRIS, which the applicant provided under confidential cover to staff, included site forms for six known resources and bibliographic data on fifteen cultural resources surveys which the CHRIS identified as having been conducted within the one-mile-radius literature review study area for the SBRP. The AFC states that these reports were reviewed for information pertinent to the SBRP (p. 8.3-10), but the findings of these reports are not included in the AFC, and the only archaeological report that is discussed in the AFC (Eckhardt and Carrico 1978, on p. 8.3-10) is not one of the fifteen reports the CHRIS listed. The cultural resources inventory in the AFC includes only the six properties for which the CHRIS provided site forms, two of which are sites possibly detailed in two of the fifteen CHRIS-listed surveys. The keywords assigned by the CHRIS to the fifteen listed reports suggest that these surveys identified a number of other sites in the one-mile-radius study area. Staff needs to review the fifteen CHRIS-listed reports and the Eckhardt and Carrico report in order to ensure that a complete inventory of cultural resources in the vicinity of the SBRP is compiled and that all resources are evaluated for significance and potential project impacts.

DATA REQUEST

67. Please provide to staff copies of the fifteen cultural resources reports listed in AFC Table 8.3-2, and a copy of the Eckhardt and Carrico (1978) report cited on AFC p. 8.3-10.

Response: To clarify, CH2M HILL received bibliographic data only from CHRIS for the reports listed in Table 8.3-2. CH2M HILL does not have copies of these fifteen technical reports, and the CHRIS information centers do not typically provide full copies as part of a standard records search request. A copy of the Eckhardt and Carrico (1978) report is provided as Attachment CUL-67.

BACKGROUND

The CHRIS also provided a Geofinder map and data print-out of properties within the proposed project's 1-mile-radius study area that are listed on the National Register of Historic Places, on the CRHR, among California State Landmarks, among California Points of Historic Interest, or on other historic property lists. Only one property was shown on the Geofinder map, and only the property's address—1196 Industrial Blvd.—and its primary number—P-37-017656—were provided in the data print-out. This property is listed as one of the keywords for the Dolan (1999) survey report cited in AFC Table 8.3-2, but the report does not provide any detailed information. Staff needs more

information on this property to assess its significance and to assess the proposed project's impacts on it.

DATA REQUEST

68. Please provide to staff copies of all CHRIS records regarding this resource, including its primary DPR 523 form and whatever forms resulted in the resource being listed on some historic property list. If this resource has not been evaluated for eligibility for the CRHR by a qualified architectural historian, please have such a specialist update the primary DPR 523 record for this resource, complete the evaluation section of the 523B form, assess the potential impact of the proposed SBRP on this resource, and provide copies of the forms and impact assessment to staff and copies of the forms to the CHRIS.

    Response: A copy of the DPR site form for P-37-017656 is provided as Attachment CUL-68. This site is a residence and remains of a gas station and is recommended as not eligible for the CRHR or NRHP. The site will not be impacted by the SBRP.

BACKGROUND

The applicant contacted 17 Native American individuals and groups seeking information on traditional cultural properties and archaeological sites. The AFC includes the responses of those Native Americans up through May 6, 2006. The applicant also contacted four local historical societies seeking information on local historic resources, but received no responses by the time the AFC was submitted to the Energy Commission. Staff needs to know if the applicant has received any additional responses from Native Americans or historical societies since that time.

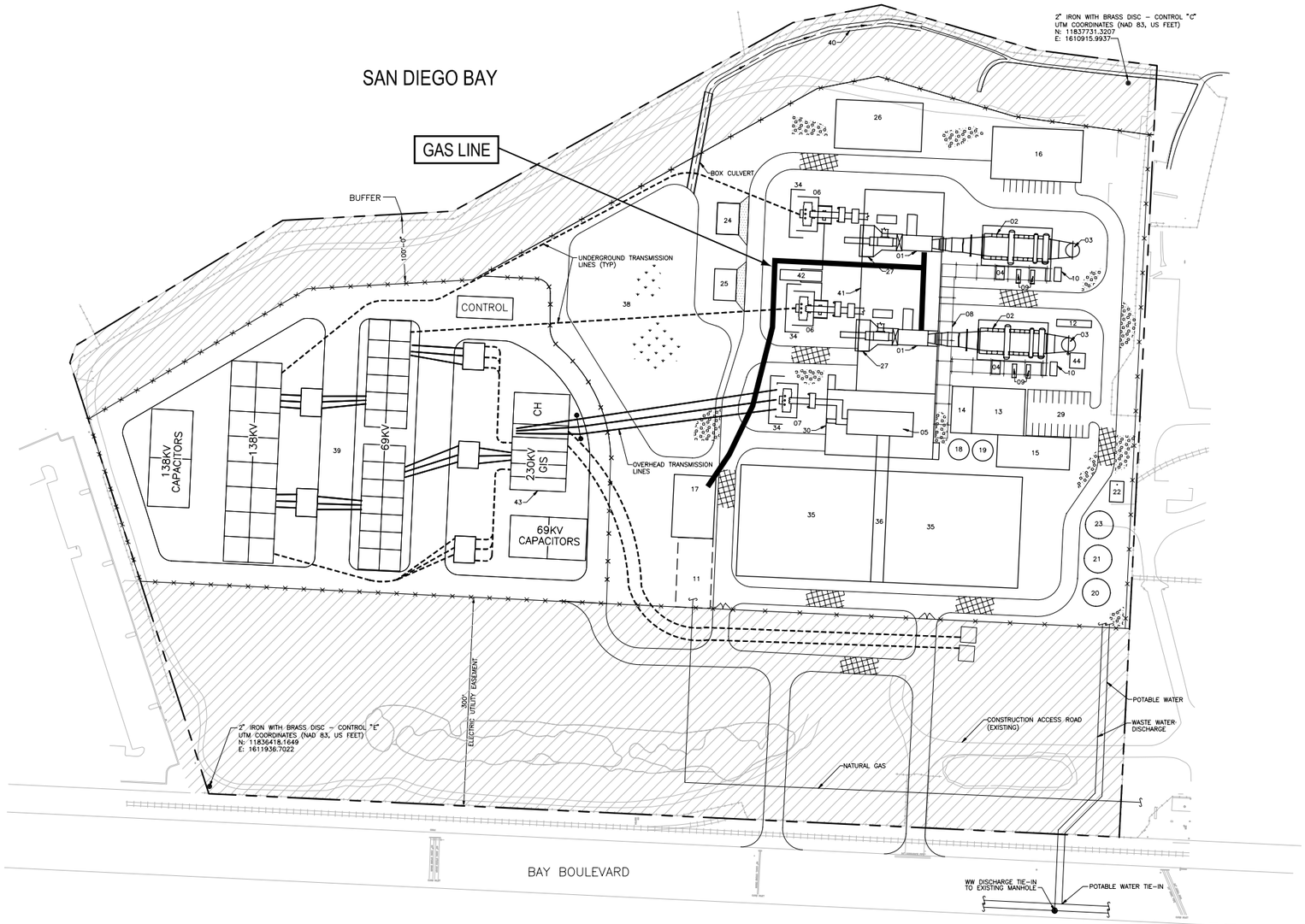
DATA REQUESTS

69. Please provide copies of any communications with Native Americans regarding the SBRP received since May 6, 2006.

    Response: No additional communication from Native Americans has been received since May 6, 2006.

70. Please provide copies of any communications with local historical societies since the AFC was submitted to the Energy Commission.

    Response: No additional communication from local historical societies has been received since the AFC was filed with the CEC on June 30, 2006.



NEW FACILITIES LEGEND

ID	FACILITY	FOUNDATION ELEVATION	HEIGHT	REMARKS
01	COMBUSTION TURBINE/GENERATOR	24' +/– 1	–	
02	HEAT RECOVERY STEAM GENERATOR (HRSG)	24' +/– 1	87' TO DECK 94' TO DRUM CL 110' TO TOP OF STEEL	
03	HRSG STACK	24' +/– 1	125'	
04	HRSG BLOWDOWN TANK	24' +/– 1	–	
05	STEAM TURBINE/GENERATOR	24' +/– 1	–	
06	CT GENERATOR STEP-UP TRANSFORMER	24' +/– 1	20'	
07	ST GENERATOR STEP-UP TRANSFORMER	24' +/– 1	20'	
08	UTILITY/PIPE RACK	24' +/– 1	110'/40'	
09	BOILER FEED PUMPS	24' +/– 1	–	
10	CEMS ENCLOSURE	24' +/– 1	12'	
11	FUEL GAS METERING/CONDITIONING STATION AREA	23' +/– 1	–	
12	OIL/WATER SEPARATOR	–	–	
13	ADMIN/CONTROL ROOM BUILDING	24' +/– 1	20'	
14	POWER DISTRIBUTION CENTER (ST/HRSG/BOP)	24' +/– 1	20'	
15	WATER TREATMENT BUILDING	24' +/– 1	20'	
16	MAINTENANCE/WAREHOUSE BUILDING	23' +/– 1	32'	
17	FUEL GAS COMPRESSOR BUILDING	23' +/– 1	22'	
18	DEMIN WATER STORAGE TANK (150,000 GALLON)	24' +/– 1	30'	
19	CONDENSATE STORAGE TANK (100,000 GALLON)	24' +/– 1	21'	
20	RAW WATER/FIRE WATER STORAGE TANK (300,000 GALLON)	24' +/– 1	28'	
21	RAW WATER/FIRE WATER STORAGE TANK (300,000 GALLON)	24' +/– 1	28'	
22	FIRE PUMP HOUSE/DIESEL STORAGE (STACK ON WEST END OF BUILDING)	24' +/– 1	16' BUILDING HEIGHT 22' STACK HEIGHT	
23	WASTE WATER STORAGE TANK (300,000 GALLONS)	24' +/– 1	28'	
24	AMMONIA STORAGE/CONTAINMENT AREA	23' +/– 1	15'	
25	HYDROGEN STORAGE AREA	23' +/– 1	–	
26	COOLING WATER HEAT EXCHANGER	23' +/– 1	20'	
27	CT INLET AIR FILTER	–	70'	
28	NOT USED	–	–	
29	PARKING	23' +/– 1	–	
30	ST GENERATION BUILDING	24' +/– 1	82'	
31	NOT USED	–	–	
32	NOT USED	–	–	
33	NOT USED	–	–	
34	SOUND BARRIER WALL	24' +/– 1	–	
35	AIR COOLED DRY CONDENSER	–	94'	
36	STEAMDUCT	–	–	
37	NOT USED	–	–	
38	STORMWATER DETENTION BASIN	–	–	
39	AREA RESERVED FOR SOUTH BAY SUBSTATION	–	–	
40	STORM WATER DISCHARGE CHANNEL	–	–	
41	CT GENERATION BUILDING	24' +/– 1	40'	
42	ELECTRICAL EQUIPMENT BUILDING	24' +/– 1	14'	
43	230KV GIS	22' +/– 1	–	
44	AUXILIARY BOILER	24' +/– 1	13' BOILER HEIGHT 125' STACK HEIGHT	

GENERAL LEGEND

- PROPERTY LINE
- FENCING
- ASPHALT SURFACE
- CONCRETE SURFACE
- AGGREGATE SURFACE
- VEGETATED SURFACE

NOTES

FIGURE CUL-62
ONSITE NATURAL GAS PIPELINE ROUTE
SOUTH BAY REPLACEMENT PROJECT
CHULA VISTA, CALIFORNIA

CH2MHILL

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RAND F. HERBERT
Principal, JRP Historical Consulting

Mr. Herbert's academic fields of specialization were in California and Western United States history. For more than twenty–five years, Mr. Herbert has worked as a consulting historian on a wide variety of historical research and cultural resources management projects, as a researcher, writer, and project manager. He has managed, written, or worked on building inventory and evaluation projects for a variety of government agencies such as Caltrans and the Department of Defense. He has given numerous lectures on the topics of public history and has provided expert witness services and testimony in more than a dozen cases or administrative proceedings. Based on his level of education and experience, Mr. Herbert qualifies as a historian/architectural historian under the United States Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61).

Professional Background

Mr. Herbert has taught history at community colleges in Sacramento and Solano counties and regularly teaches a graduate seminar in public history at California State University, Sacramento (2001–present). In 1990, he was elected chairman of the California Council for the Promotion of History (CCPH) and served a two-year term. He served as one of CCPH's representatives on California Resources Secretary Douglas Wheeler's Historic Preservation Task Force (1992–1994); and on the National Cultural Alliance's Cultural Awareness Campaign, California Steering Committee. Mr. Herbert is a Registered Professional Historian (#508) with CCPH and a member of the National Council on Public History, California Historical Society, Ninth Circuit Court Historical Society. Mr. Herbert earned is MAT in History for the University of California Davis and his BA in History from the University of California, Berkeley.

Relevant Experience

- Finding of Effects for Caltrain San José Diridon Train Station Offices Improvement Project, San Jose, California. Prepared for VBN. 2006–In Progress.
- Inventory and Evaluation, South Bay Power Plant, Chula Vista, San Diego County, California. Prepared for CH2MHill. 2006–In Progress.
- Historic Resources Inventory and Evaluation Report, Placer Ranch Offsite Road and Utility Corridors, Placer County, California. Prepared for URS Corporation. 2006–In Progress.
- Photodocumentation for Building 89, Naval Station San Diego. Prepared for Far Western Anthropological Research Group. 2006–In Progress.
- Historic Resources Report, Santa Clara Valley Water District Dams. Prepared for MHA/SCVWD. 2006.
- SACOG. Prepared for . 2006.
- SACOG. Prepared for URS. 2006.
- Southwest Div. On-Call Cultural Resources Consulting Contract. Prepared for Navy: Southwest Division NAVFACENG COM, San Diego. 2005–In Progress.
- Historic Resources Inventory and Evaluation of Riolo Vineyard. Prepared for URS Corporation. 2005–In Progress.

- Historic American Buildings Survey, Signal Corps Radar (S.C.R) 296 Station 5 Transmitter Building Foundation and Fort Barry Bonita Ridge Access Retaining Wall. Prepared for Assoicated Cultural Resource Experts, LLC. 2005–In Progress.
- Historic Resources Evaluation Report: Buckhorn Grade Improvement Project, Shasta and Trinity Counties, California. Prepared for URS Corporation. 2005–In Progress.
- Inventory and Evaluation Report and Impacts Analysis Document for 1938 Broadway Project, Oakland, Alameda County, California. Prepared for URS Corporation. 2005–In Progress.
- Inventory and Evaluation of High Water Bridge at Camp Roberts, Monterey County, California. Prepared with Tetra Tech for US Army National Guard Reserve. 2005–In Progress.
- Lava Cap Mine Historical Resource Inventory and Evaluation, Nevada County, California. Prepared for CH2MHill. 2005–In Progress.
- Historic Properties Survey Report for the D Street Bridge Rehabilitation Project, Petaluma, Sonoma County, California. Prepared with URS Corporation for Caltrans District 4. 2005–In Progress.
- Historic Resources Inventory and Evaluation Report, Napa Salt Marsh Restoration Area, Napa County, California.. Prepared for URS Corporation. 2005–In Progress.
- Historic Context Report and DPR 523 Form, Lauer Dam. Prepared for Far Western Anthropological Research Group. 2005–In Progress.
- Historic Inventory and Evaluation Report and Finding of Effect Report for the Peninsula Joint Powers Board Four Track Project, Brisbane and South San Francisco, San Mateo Coutny, California, Caltrain Mileposts 6.0 to 9.7. Prepared for Parsons Transportation Group. 2005–In Progress.
- Trans Bay Cable Project, Historical Resources Study, Contra Costa County and San Francisco County, California. Prepared for URS Corporation. 2005–In Progress.
- Historic Land Use Study for the Bridgeview Energy Facility, Antioch, Contra Costa County, California. Prepared for URS Corporation. 2005–In Progress.
- Quail Hollow Road Bridge Replacement Project, Santa Cruz County, California. Prepared for URS. 2005–In Progress.
- Finding of Effects for Building Improvement Projects, NAWS China Lake. Prepared for . 2005–In Progress.
- Contra Costa Canal study. Prepared for Contra Costa Water District. 2005–2006.
- Historic Resource Evaluation Report: Rumrill Boulevard Bridge Replacement Project, San Pablo, Contra Costa County, California. Prepared for California Department of Transportation, District 4. 2005.
- Historic Resource Inventory and Evaluation: Eastern Sierra Regional Airport, Inyo, California. Prepared for . 2005.
- Emeryville Park Avenue Initial Study. Prepared for URS Corporation. 2005.

- Yosemite Village. Prepared for URS Corporation. 2005.
- McClellan Business Park Historic American Buildings Survey Building 231. Prepared for McClellan Business Park. 2005.
- Me ID Transmission Lines. Prepared for Russell Associates and Merced Irrigation District. 2005–.
- Historic Properties Inventory and Evaluation: AC Transit East Bay Bus Rapid Transit Project. Prepared for Parsons Transportation Group. 2004–In Progress.
- Historical Resources Inventory and Evaluation Report of the Adams Auxiliary and Adams Main Powerhouses, Owens River Gorge, Mono County, California. Prepared for City of Los Angeles Department of Water and Power. 2004–2005.
- Marin Rod and Gun Club Pier. Prepared for URS Corporation. 2004.
- Historic Resources Report: Lower Owens River Channel Obstruction Survey, Owens Valley, California. Prepared for Montgomery Watson Harza and Far Western Anthropological Research Group. 2004.
- Historic Resources Inventory and Evaluation Report for Placer Ranch, Roseville, California. Prepared for URS Corporation. 2004.
- NAWS China Lake Mining Sites Preliminary Survey, Twenty Mule Team Route, and New York Mine, and 69 mines at China Lake. Prepared for Epsilon Systems Inc.. 2003–In Progress.
- Phase II Cultural Resources Evaluation of Selected World War II and Cold War Era Buildings and Structures, Edwards Air Force Base, California (Draft), September 2004. Submitted to U. S. Army Corps of Engineers, Sacramento District. Prepared with TetraTech, Inc. for Air Force Flight Test Center, Base Historic Preservation Office, Edwards Air Force Base, California. 2003–2006.
- Historic Resources Evaluation Report: Highway 101 HOV Lane Widening and Improvements Project, Old Redwood Highway, Petaluma to Rohnert Park Expressway, Rohnert Park, Sonoma County, California. Prepared for Parsons Transportation Group, Caltrans. 2003–2005.
- Historic Resources Evaluation Report: Highway 101 HOV Lane Widening and Improvements Project, Steele Lane in Santa Rosa to Windsor River Road in Windsor, Sonoma County. Prepared for Parsons Transportation Group, Caltrans. 2003–2005.
- Historic Properties Survey, AFC, City of San Francisco Potrero Energy Facility. Prepared for CH2M Hill Corporation. 2003–2004.
- Design Guidelines and Project Considerations Regarding Santa Clara Depot and San Jose Diridon Station as Historic Properties for the Peninsula Corridor Joint Powers Board Caltrain Santa Clara to San Jose Corridor Improvement Project. Prepared for HNTB Corporation. 2003–2004.
- Historic Resources Evaluation Report: Waterfront Drive Extension Project, Eureka, Humboldt County California. Prepared with North State Resources, Inc. for City of Eureka and California Department of Transportation. 2003–2004.

- Historic Resources Evaluation Report. Lagoon Valley Project, Vacaville, California. Prepared for EIP Associates. 2003–2004.
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ARCHAEOLOGICAL TEST AND DATA RECOVERY PROGRAM AT TELEGRAPH CANYON, CHULA VISTA, CALIFORNIA

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September 1978

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ARCHAEOLOGICAL TEST AND DATA RECOVERY PROGRAM AT TELEGRAPH CANYON, CHULA VISTA, CALIFORNIA

1.0 PREFACE

In 1975, the Department of the Army, Corps of Engineers directed that a cultural resource assessment of portions of Telegraph Canyon Creek be made in conjunction with a proposed flood control project scheduled for that drainage. Under contract with the Corps of Engineers, San Diego State University Foundation prepared an environmental impact report detailing results of an intensive literature search and surface reconnaissance of the project area (Leach 1975a). Although the results of the surface survey were negative in that no historic or prehistoric sites were identified (Leach 1975a:19), ethnographic evidence suggested that much of the region surrounding the creekbed would have had high resource value to early native populations in the at least recent prehistoric past (Leach 1975a:4-7).

The possibility of an unsuspected, buried archaeological site could not be entirely discounted (Leach 1975a:25-27), and the Corps of Engineers determined to investigate further. At the request of the Department of the Army, Corps of Engineers, WESTEC Services, Inc. contracted to provide a limited-control, test trench investigation of properties adjacent to Telegraph Canyon Creek from the mouth of the canyon in San Diego Bay to 1,800 feet inland.

Results of the subsurface testing were negative. No cultural deposits of either the historic or prehistoric past were encountered,

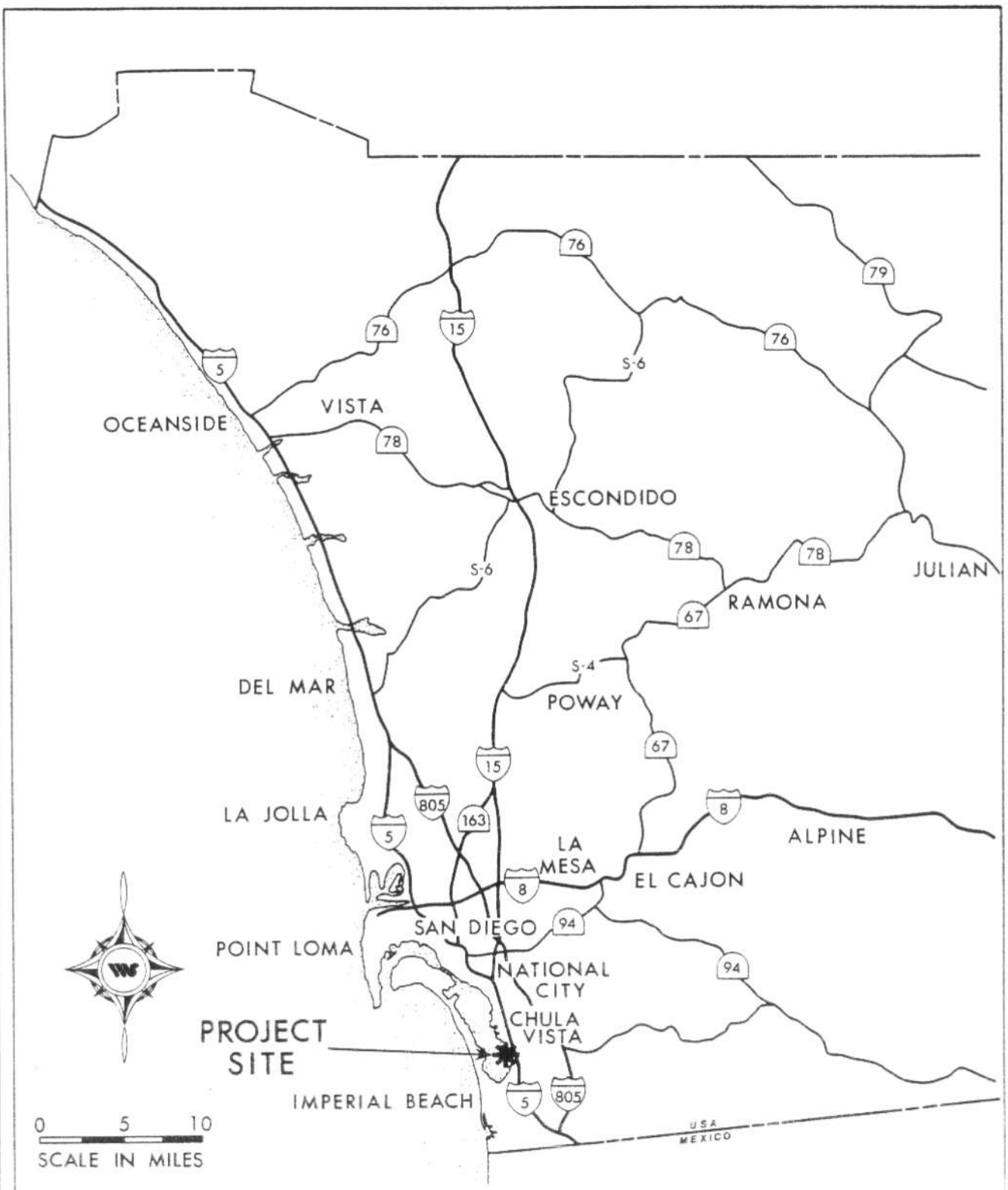
although some historic debris (i.e. metal bolts, rusting cable, and pipelines) were noted. Material information with regard to this testing and subsequent analysis are provided in Sections 5.0 and 6.0 of this report.

2.0 PROJECT SETTING

2.1 INTRODUCTION

A series of four mechanically dug trenches were excavated and analyzed with regard to subsurface cultural content along the channeled creekbed at the mouth of Telegraph Canyon in Chula Vista, California. The first phase of testing was conducted on September 7 and 8, 1978. Analysis of the test trenches was concluded and the trenches refilled on September 14, 1978. Both field and laboratory aspects of this investigation were supervised by William T. Eckhardt, WESTEC Services' project archaeologist. Assisting with the field and laboratory exercise were Randy Franklin, Brian Hunter, Tracy Selvaduvai, and Kre Easland, archaeological aides. Approximately 64 work hours were expended during both field and laboratory tasks of this archaeological test.

The proposed Telegraph Canyon flood control project is located in southwestern San Diego County, approximately 152 meters (500 feet) west of the intersection of L Street and Interstate 5, in the City of Chula Vista, California (Figure 1). The subject property is situated east of the tidal flat along the eastern shore of San Diego Bay, west of Bay Boulevard, and immediately north of San Diego Gas & Electric Company's South Bay Generating Plant. As depicted on the Imperial Beach U.S.G.S. 7.5 minute quadrangle, the



PROJECT SITE IN RELATION TO WESTERN SAN DIEGO COUNTY.

FIGURE 1

project is located in an unsectioned portion of the Rancho de la Nacion land grant, Township 18 South, Range 2 West (Figure 2).

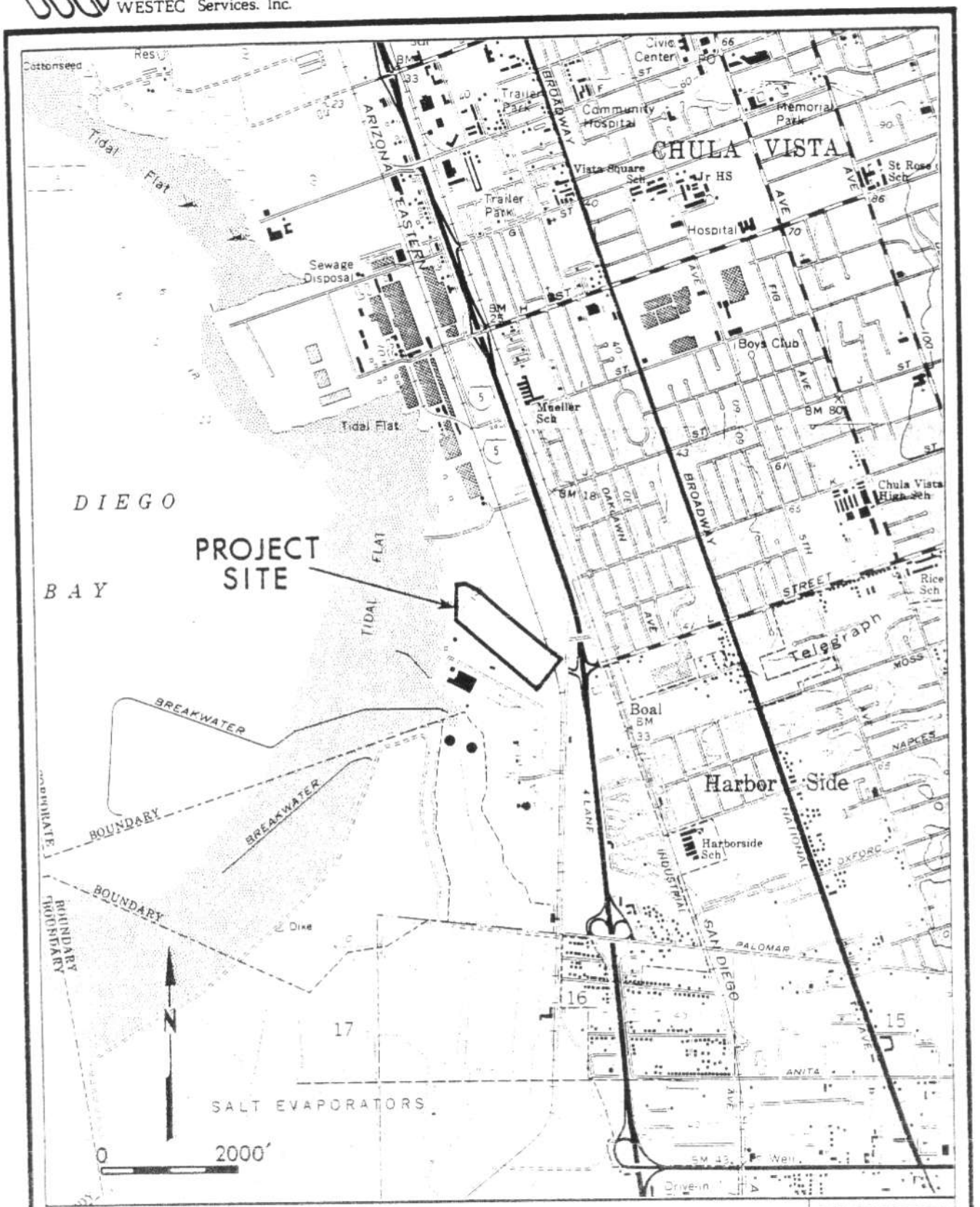
2.2 REGIONAL POTENTIAL

The physical setting in the region of Telegraph Canyon Creek (prior to historic times) would have been highly conducive to the exploitative processes of early native American peoples. This point was clearly presented in the previous impact survey report prepared for the proposed flood control project (Leach 1975a:2-7). Briefly, the region's potential for cultural resources is discussed below.

Urbanization in the areas surrounding Telegraph Canyon Creek has been on-going for at least sixty years (Leach 1975a:16), and is sure to have covered over numerous prehistoric sites which may have been situated along the low-lying terraces overlooking San Diego Bay within the specific area of current study (some 1,800 feet of channeled creekbed between Interstate 5 and San Diego Bay) there is substantial evidence that the ground surface has been constructed by filling in natural salt marsh tidelands (Leach 1975a:19-20).

The creek itself cuts through sediments and marine terraces of Pleistocene and pre-Quaternary age, but may never have been more than an intermittent stream. In contrast, the broad channels of the Sweetwater and Otay Rivers suggest a much more reliable source of fresh water for local aboriginal inhabitants.

Lithic resources which could have been used in stone tool manufacture are somewhat common within the study area, found in the scattered cobble lenses (providing suitable material for milling stones and other cobble tools) throughout the geologic formations discussed



TOPOGRAPHIC MAP SHOWING LOCATION OF PROJECT SITE (PORTIONS OF IMPERIAL BEACH AND NATIONAL CITY U.S.G.S. 7.5 MINUTE QUADRANGLES).

FIGURE 2

above. Additionally, dikes and veins of quartz and metavolcanic rock are to be found well within the probable land-use territory of the peoples who inhabited the area.

The biological setting for Telegraph Canyon was previously described in detail by Leach (1975a:4-7), and may be summarized as an area rich in exploitable resources. Biotic communities include Coastal Sage Scrub, Riparian, and Coastal Salt Marsh. Potential food resources in the region included four types of animal populations: land animals, birds, mollusks, and fish.

In summary, the entire region could have served as a vast resource area that was probably exploited by native Americans on a regular basis, depending on available foodstuffs, lithic resources, and fresh water supply. An exploitation pattern such as this could result in archaeological sites indicative of semi-permanent maintenance operations (i.e. village), temporary camping, food processing, and seasonal occupation.

3.0 BACKGROUND DATA

The San Diego Bay region has not received the quantity nor level of archaeological investigation afforded areas such as coastal northern San Diego County (see Koloseike 1968:371-382; 1969: 143-162; Kaldenberg and May 1975:3-6; Kaldenberg and Ezell 1974; Moriarty *et al.* 1959:185-216; Carrico 1976b:1-158; Shumway *et al.* 1961:37-72; Wallace 1960:277-366; Warren 1961:246-291; Warren and Pavesic 1963:407-438; Warren 1964), or the Cuyamaca Mountain area (True 1966, 1970). Although several small-scale environmental impact surveys (Bull 1973; Leach 1975a; Carrico 1976) and two limited

test excavations (Leach 1975b; Bull 1977) have been conducted in the outlying regions of the Telegraph Canyon project area, there have been no major excavations or large-scale surveys oriented toward the testing of carefully researched hypotheses regarding the patterning of prehistoric native populations.

Data and information synthesized into this brief overview are the result of an evaluation of records at San Diego State University and the Museum of Man. Additional information was obtained through a literature search of pertinent archaeological and historical documents, including: *National Register of Historic Places, California Landmarks* and other local directories; communication with other archaeologists; analysis of environmental impact reports conducted within the study area, and examination of other primary sources. A more in-depth discussion of previous land use in the project area can be found in the previous environmental impact report prepared in conjunction with the proposed flood control project (Leach 1975a:8-16).

3.1 CULTURAL HISTORY

In the prehistoric past, the area now comprising San Diego County was densely occupied by native American peoples including at least three major cultures. From roughly 12,000 to 8,000 years ago, the San Dieguito people were the sole inhabitors of this region. Beginning about 8,000 years ago and extending to about 3,000 years ago, the La Jollan-Pauma culture was in existence, with the Pauma aspect being present in the inland regions. Commencing

about 2,500 years ago and extending into the Spanish period, the Kumeyaay (Diegueño) lived and hunted in the area. A broad overview of the three major cultural patterns is provided below.

The following cultural history is a means of outlining and briefly describing the known prehistoric cultural traditions. A primary goal of a cultural history is to provide a diachronic or developmental approach to past lifeways, settlement patterns and cultural processes.

Lacking a synthesis of valid, regionally specific data, we are forced to fall back on a geographically generalized accepted cultural history which is, at best, ill-defined and probably outmoded. As perceived by recent scholars, at least three major cultural patterns have operated in San Diego County (Table 1). There is also the possibility that a much older "Early Man" period may have existed in North America, if not San Diego County.

Recent research and experimentation with amino-acid dating (Bada 1974) has given new life to a decades-old assertion (Carter 1957) that humans were in the New World, and specifically along Mission Valley and the San Diego River, over 40,000 years ago. Although such a possibility exists, and continuing research seems to point in that direction, many scholars are unwilling to categorically state that humans occupied the New World before approximately 30,000 years ago. Continued research in the Arctic region and within our own area should help in resolving the date of initial New World occupation.

Table 1

CHRONOLOGICAL MODEL FOR SAN DIEGO COUNTY PREHISTORY AND HISTORY

CLIMATE	TIME	CULTURAL SETTING	STAGE
Medithermal			
Moderately warm; arid and semi-arid	1876 A.D.	Reservation Period	
	1850 A.D.	Anglo-European Era	
	1830 A.D.	Mexican Era	
	1769 A.D.	Hispanic Era	Historic
	1542 A.D.	Spanish Era	Protohistoric
	1000 A.D.	Late Prehistoric cultures	Late Milling
	3,000 B.P.	La Jolla Complex termination	
Altithermal	4,000 B.P.		
	6,000 B.P.	Los Compadres (W-578) occupied	
Arid, warmer than present	7,500 B.P.	La Jolla Complex	Early Milling
Anathermal	8,000 B.P.		
		Harris Site (SDi-149) occupied	
Climate like present but growing warm, humid and subhumid	9,500 B.P.	San Dieguito Complex	Paleo-Indian
End of Glaciations	10,000 B.P.		
	21,000 B.P.	Yuha Man	Early Man
	48,000 B.P.	Del Mar Man	Early Man

3.1.1 San Dieguito

The oldest well-documented inhabitants of the region were apparently the Paleo-Indian San Dieguito people. Typified as nomadic large-game hunters, these people occupied the mesas, mountains and deserts of San Diego County roughly between 21,000 and 8,000 years ago (Warren 1961:252-253; Rogers 1966:140-148; Ezell 1974:personal communication). The culture of the San Dieguito people has been divided into three relatively distinct phases representing assumed variations in time and space. Within these three phases exists various "industries" that are geographically and ecologically based; these are not of specific concern in this analysis. San Dieguito I, the oldest of the known Paleo-Indians in San Diego County, inhabited the desert regions east of the Cuyamaca/Laguna mountain ranges as long ago as 21,000 years (Childers 1974; Ezell 1974:personal communication).

In general, the ancient hunters of the San Dieguito I phase apparently left little or no permanent record on the land, except for their scattered lithic tools, waste stone debris and two recently discovered burials in the Yuha Basin-Truckhaven area (Rogers 1939:25-31; Ezell 1974:personal communication; Childers 1974; Wallace 1955:189-191). Broad characteristics of the San Dieguito I people include their manufacture and use of crudely formed stone flakes, blades and scrapers.

San Dieguito II is found both in the desert and throughout western San Diego County. Lithic artifacts represented by this phase include more finely worked blades, somewhat smaller

and lighter points, and a larger variety of scrapers and choppers. In general, however, the same morphological types remain basically unchanged from the earlier phase. Like their predecessors, these people were medium-to-large-game hunters, although foraging must have served to supplement their diet (Warren 1961:262; Moriarty 1969:1-18), perhaps to a greater extent than most scholars have implied.

The terminal San Dieguito phase, San Dieguito III, represents a morphological and typological change, as indicated by an altered technology. The tool types become far more varied both in style and in functional design, thus indicating a change in the culturally determined mental templates. Such alteration in technological form can be attributed to environmental adaptation and/or a technological "snowball" effect, wherein technological advances and changes thrive and feed on themselves and progressively create a new technological mode.

As a result of such technological changes, the tools of the San Dieguito III phase exhibit not only a wider variety of tool types, but also a fundamental refinement in tool manufacture. A primary difference in tool technology is represented by the introduction of pressure-flaked blades and points. Unlike simple percussion flaking, pressure flaking requires a more delicate touch and more finely conceived mental template. The resulting tools exhibit form, complexity and balance not found in the early phases of the San Dieguito people.

Other diagnostic traits associated with San Dieguito III include planes, choppers, plano-convex scrapers, crescentic stones, elongated bifacial knives, and intricate leaf-shaped projectile points (Rogers 1939:28-31). Beyond specific tool types and the introduction of pressure flaking, there exists no absolute method of discerning between San Dieguito II and III. Patination, a weathering process involving chemical change on the surface of stones, is a relative guide to antiquity and provides gross distinctions between the San Dieguito phases; however, its use is limited by the many variables which are involved in its application.

3.1.2 La Jollan-Pauma

By about 7,000 years ago, a new group of peoples had begun to inhabit and exploit the coastal and inland regions of San Diego County (Moriarty 1969:12-13). These people, the La Jollans, were nomadic exploiters of maritime resources (Harding 1951; Moriarty *et al.* 1959:185-216; Wallace 1960:277-306), who also relied on seed gathering and vegetal processing. The La Jollans may have been entering into the mortar and pestle phase late in the terminal stage of the La Jollan-Pauma transitional period (Warren 1961). The tool types of the La Jollans indicate that these members of what Wallace (1955) terms Early Milling Horizon possessed a far greater reliance on the sea and foraging than their predecessors, the San Dieguito people, although Kaldenberg and Ezell (1974) have excavated at least one San Dieguito site, W-49, which contained a well-defined shell midden. The variety and quality of lithic tool

manufacture is much more basic and unrefined when compared with even the basal phase of the San Dieguito complex.

Characteristic traits of the La Jollan culture include fire hearths, shell middens, flexed inhumation, grinding implements, and absence of ceramics. The archetype La Jollan sites are located along the coast near bay or lagoon areas. In recent years, inland La Jollan sites of a seemingly later period have been discovered in transverse valleys and sheltered canyons, including Valley Center (True 1959:225-263; Warren *et al.* 1961:1-108; Meighan 1954:215-227). These non-coastal sites have led to a new name for La Jollan-type sites with an inland location. True (1959), Warren (1961) and Meighan (1954) had applied the term Pauma Complex to certain inland sites which possess a predominance of grinding implements (especially manos and metates), lack of shell, greater tool variety, more sedentary life patterns than expressed by San Dieguito sites, and an increased dependence upon gathering. However, it is more probable that these inland sites represent a non-coastal manifestation of Early Milling peoples who adopted or developed a hunting mode more so than their coastal brethren. Wallace (1955:214-230) denotes this late transitional phase as Intermediate, and establishes its position between Early Milling Horizon and Late Milling Horizon.

3.1.3 Kumeyaay/Northern Diegueño - Luiseño

By 2,000 years ago, Yuman-speaking peoples sharing cultural elements had occupied the Gila/Colorado River drainage (Moriarty 1966). Through gradual westward migration the Yumans

drifted into Imperial and San Diego Counties, where they came into contact and apparently acculturated with the remnants of the Early Milling La Jollan cultural tradition (Moriarty 1966; 1965). Because of basic similarities in the late La Jollan/early Yuman patterns, it is difficult to clearly define the contact period or point between La Jollan/Yuman.

Dr. James R. Moriarty (1965; 1966) has suggested that there existed a pre-ceramic Yuman phase, as evidenced from his work at the Spindrift Site in La Jolla. Based on a limited number of radiometric samples, Moriarty has concluded that a pre-pottery Yuman phase occupied the San Diego coast 2,000 years ago and that by 1,200 years ago ceramics had diffused from the eastern deserts.

Although some researchers still follow Malcolm Rogers' belief that Yuman peoples first appeared in San Diego County only 1,000 years ago (Rogers 1945), there is a growing body of data supporting Moriarty's hypothesis. A recent excavation of a La Jollan/Kumeyaay site in Sorrento Valley (Carrico 1975) encountered a cultural stratification with a basal date of 3,755 years ago and a terminal date of 2,525 years ago. It is worth noting that the upper stratum (0-10 centimeters) of the dated column contained ceramics and projectile points commonly considered time-markers indicative of Late Milling Kumeyaay. Radiometric dating of a large shell sample from this stratum produced a date of 2,525±70 years B.P. The near absence of ceramics and total lack of projectile points below the 10-centimeter level, within a series of strata that contained a variety of seemingly early cultural material dated at 2,925±70 B.P. (30-40 centimeters) and 3,755±75 B.P.

(50-60 centimeters) may indicate that the Rimbach Site is a multi-component, culturally stratified site containing a transition between La Jollan and Yuman circa 2,500 years ago.

Whether the Yuman peoples moved into the area 2,500, 2,000, or 1,500 years ago, they brought with them a culture heavily influenced by their Yuman neighbors in the eastern desert region of California and along the Colorado River. These prehistoric/proto-historic peoples possessed ceramics, operated a closely knit clan system, utilized a highly developed grinding technology, had elaborate and extremely complex kinship patterns, created rock art, and carried on extensive trade with the surrounding cultural areas (Rogers 1945:167-198; Kroeber 1970:709-725; Strong 1929). It has also been postulated that the Kumeyaay and their northern neighbors, the Luiseño, may have been practicing a basic type of protoagriculture prior to Hispanic contact (Lewis 1973; Shipek 1974:personal communication; Treganza 1947).

About 1,000 to 1,500 years ago, a group of Shoshonean-speaking people migrated out of the Great Basin region and intruded like a wedge into southern California. This wedge separated the Yuman groups and was eventually to cause great cultural variations (Kroeber 1970:278; True 1966). In coastal San Diego County, this group of Shoshonean intruders has been labeled the San Luis Rey I and II Complex (Meighan 1954:215-227). When the early Hispanic explorers contacted these people, they called them Luiseños, after the Mission San Luis Rey de Francia founded in the heart of Luiseño (San Luis Rey II) territory.

Although of a different linguistic stock, the Luiseño and the Kumeyaay (Diegueño, after San Diego) shared many cultural traits. D.L. True (1966) has suggested that basic similarities in ecological exploitation, environmental setting and temporal placement forced the late-coming and highly nomadic Shoshoneans to adapt to a life style and cultural pattern that was established and functioning upon their arrival. D.L. True outlines certain attributes or traits which he finds as dissimilar between the two cultures. He notes that Luiseño projectile points are more basic than those of the Kumeyaay; those of the Luiseño are predominantly made of quartz. He also notes that ceramics were evidently a late development of the Luiseño; they probably learned the use of pottery from the Northern Diegueño. True also postulates the Luiseño possessed a very small, very closed trade network; that in general they were not as world-aware as the Kumeyaay, although Luiseño cosmology and religion seem better developed.

3.1.4 Protohistoric Period

The Hispanic intrusion (1769-1822) into native-American southern California affected the coastal tribes and peoples living in well-traveled river valleys. The Mexican Period (1822-1848) saw continued displacement of the native population by expansion of the land grant program and development of extensive ranchos. The Gold Rush and the concomitant granting of statehood, combined with an influx of aggressive, land-hungry Anglos, caused a rapid displacement of the natives, as well as deterioration of their culture and life-ways (Shipek 1974; Bancroft 1886; Kroeber 1970).

The literature on these later peoples, the Kumeyaay, Luiseño, Cahuilla, Cupeño and others, is rather extensive and includes Barrows (1900), Bean and Saubel (1972), Caughey (1952), Gifford (1918), Hayes (1929), True (1970), Heizer and Whipple (1957), Hooper (1920), Kroeber (1970), Cuero (1968), Sparkman (1908:87-234), and Strong (1929).

4.0 INVESTIGATION TECHNIQUES

4.1 INTRODUCTION

Based on the previous survey report for the proposed Telegraph flood control project, no cultural resources were known or suspected to exist within the project area (Leach 1975a:19-22). However, that document strongly suggested the possibility of unsuspected buried cultural resources (Leach 1975a:23, 25), and this could not be overlooked by the Corps of Engineers (Martz 1978: Personal Communication). The legal mandates compelling vigorous cultural resource management on the part of the Corps include the National Environmental Policy Act (Public Law 91-190), Archaeological and Historical Preservation Act (Public Law 93-291), and Executive Order 11593 (36 F.R. 8921).

Fulfillment of the mandates mentioned above, and the accurate timing of development schedules for the proposed project required that at least minimal subsurface testing be undertaken to assess buried deposits along specific portions of the channeled creekbed (see Figure 2). Direction as to the method (e.g. backhoe trenching) and amount of subsurface excavation was provided by Department of the Army, Corps of Engineers, Los Angeles District Environmental Planning Section (Martz 1978: Personal Communication).

Testing procedures employed during this phase of investigation were varied. Four trenches were mechanically excavated (employing a backhoe and operator), barricaded, and backfilled. Soil profiles were measured and drawn to scale, and soil samples were retrieved from each strata identified. Accurate instrument locations for each trench relative to known control monuments were also recorded. The following subsections detail the various testing procedures briefly discussed above.

4.2 TEST TRENCHING

The highly technical nature of land use along those portions of Telegraph Canyon Creek scheduled for test excavations required the collaboration of informed representatives from the Corps of Engineers, San Diego Gas & Electric Company, and WESTEC Services, Inc. to determine the optimal locations for trenching. Several areas in the immediate vicinity were known to contain subsurface cables used to control SDG&E's power network, and required avoidance. Additional hazards included high pressure subsurface gas and petroleum pipelines, low voltage subsurface cables, etc. After careful consideration, four test areas were picked where it was determined that no hazardous subsurface improvements would be encountered.

WESTEC Services, Inc. contracted with Burgess Dean Trenching and Backhoe Service for the trench excavations. Employing a Case 580B backhoe with an 18-inch bucket, operator Eddie Caplenger performed the trenching and backfill services.

Trenches were excavated in approximate 6 foot (1.8 meter) levels, requiring (in most instances) two passes over the trench to reach the appropriate depths. Initially, it was intended that all of the

backfill from the trenching operations be passed through one-eighth-inch mesh hardware cloth and scrutinized for cultural remains. This procedure was found unfeasible due to the clay content in all but the top five centimeters of topsoil for any of the trenches excavated. Instead, the screening of subsurface soils was continued on a lesser scale, allowing detailed inspection of sample deposits for each of the strata encountered. At all times the trenching was under close scrutiny for the recovery of suspected artifacts, or the disturbance of identifiable cultural lenses (strata).

4.3 SOIL PROFILES

Scaled profile maps of a single sidewall for each trench were prepared immediately after trenching. Measuring north to south, each trench was "ticked" at 50 centimeter increments, and along these stations measurements for the bottom of the trench and each strata above that were recorded. This process was continued until a sidewall profile was completed for each trench, documenting the soil strata, observed concentrations, and historic disturbance.

4.4 SOIL SAMPLES

Two series of soil samples were gathered from the test trench investigations. On the lowest order, soil samples were gathered from strata containing mollusk remains, or other observable materials to facilitate more accurate analyses. Soil samples were also collected for the Corps; these being samples (in excess of one pound) taken from each identifiable stratum in each of the four test trenches. These samples were sent (without prior analysis) to the Corps of Engineers, Los Angeles District Headquarters.

4.5 ACCURATE INSTRUMENT LOCATIONS

To provide concise information with regard to the location of test trenches, it was determined that an accurate instrument survey be made. Using a control monument (horizontal Control Second Order or better; vertical control Third Order) as primary datum, shots were taken of the northerly and southerly points of each test trench. These data were recorded on survey data forms for later translation to scaled contour maps (scale:1:2400).

5.0 SUMMARY OF TEST RESULTS

Results of test trenching along the westernmost 1,800 feet (approximate) of Telegraph Canyon Creek were negative. No historic or prehistoric cultural resources were encountered in any of the four trenches excavated. Standardized scale profile maps are provided throughout the following discussion, and the locations of all test trenches may be seen in Figure 3). A photo record of trenching exercises and a geological report on the nature of observed subsurface strata are attached at the end of this report (Attachments A and B, respectively) to aid in the interpretation of test results.

- Trench 1

As shown in Figure 4, Trench 1 consisted of five visible strate, the last of which was groundwater encountered at 2.6 meters (8.53 feet) deep. From surface to bottom, the trench revealed at least four identifiable strata. The first 10 to 25 centimeters (4 to 10 inches) exhibited a compact, dry clay with

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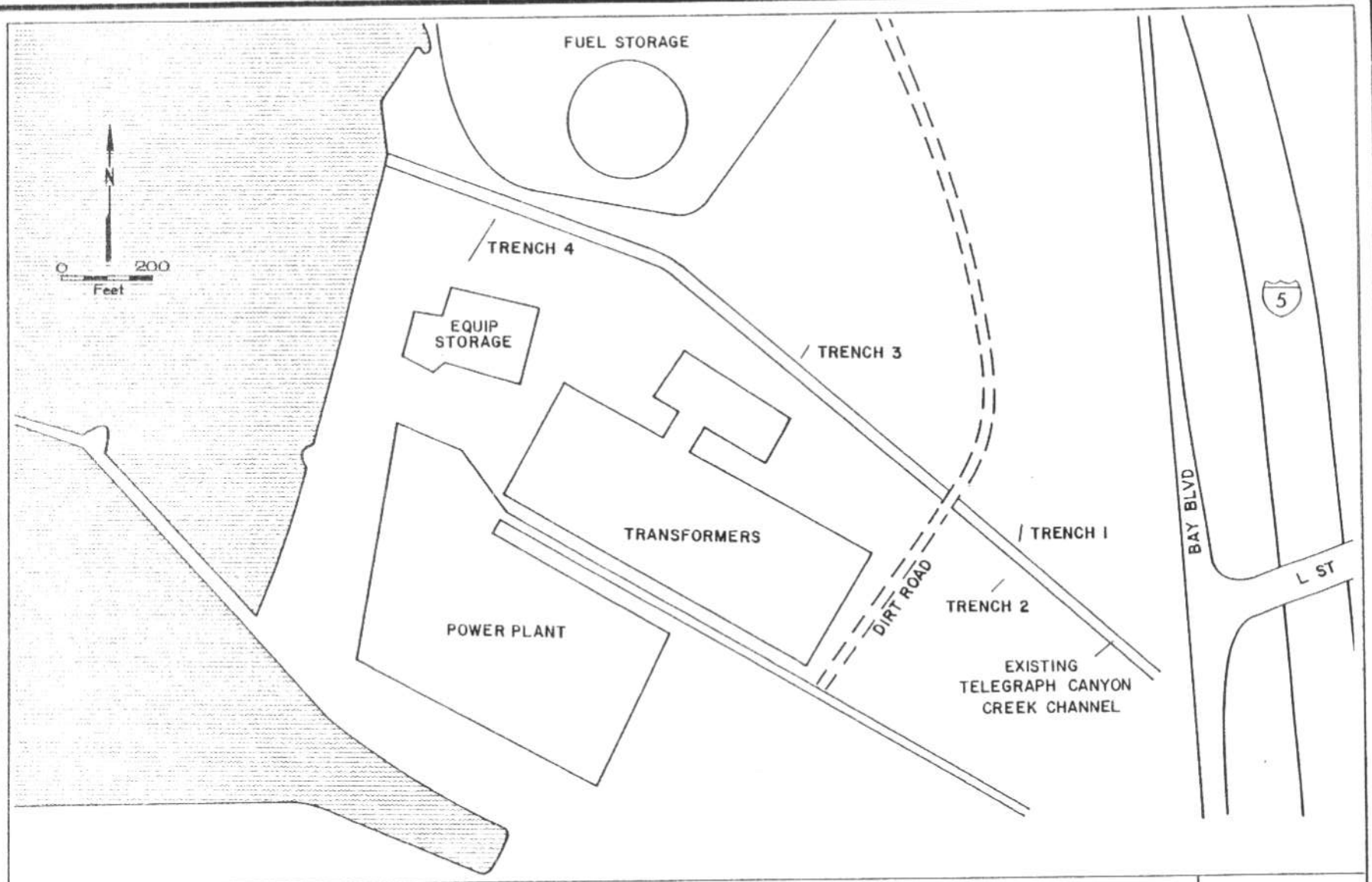

TEST TRENCH LOCATIONS RELATIVE TO EXISTING IMPROVEMENTS ALONG TELEGRAPH CANYON CREEK.

FIGURE 3

cobble inclusions (poorly sorted). To depths of some 70 centimeters (27.5 inches) concreted brown clays were noted. Below these, a rather stable layer of dark compact clays with caliche inclusions was observed (dark brown to black), extending to a depth no greater than 1.5 meters (59 inches). Below this and continuing to the trench bottom, compact, concreted clays (light brown to brown) were encountered.

The total dearth of cultural remains, coupled with the apparently stable strate suggest either a long-term, relatively static deposition of soils, or a constructed ground surface through the artificial placement of fill soils.

- Trench 2

Comprised of four visible geologic strata (Figure 5), Trench 2 was excavated to a depth of 3.4 meters (11.1) feet. Groundwater was encountered at or about 3 meters (9.8 feet) in depth. As with Trench 1, this subsurface test exhibited only negative information with regard to cultural debris: No material remains of historic or prehistoric activities were encountered.

Visible strata for Trench 2 were similar to those identified in Trench 1. A surface cover of dry, sandy clay was observed to a maximum depth of 20 centimeters (7.8 inches), overlaying a generally stable sand lens occurring to a depth of 50 centimeters (1.5 feet). Limited amounts of shellfish remains were observed in this sand lens, and were also noted (more numerously) in an intrusive deposit of sands, gravel and shellfish

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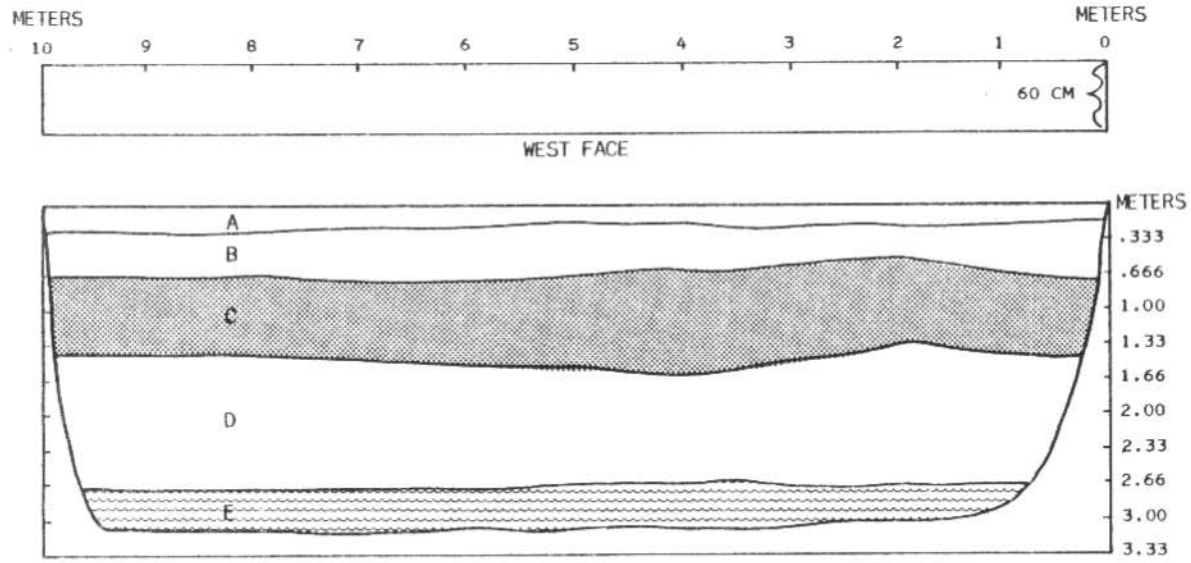

A. COMPACT DRY CLAY WITH COBBLE INCLUSIONS
B. CONCRETED BROWN CLAY
C. DARK COMPACT CLAYS WITH CALICHE INCLUSIONS, DK. BROWN TO BLACK
D. COMPACT, CONCRETED CLAYS, BROWN TO LIGHT BROWN
E. STANDING WATER

TRENCH 1. CORPS OF ENGINEERS/TELEGRAPH CANYON CREEK; COMPASS BEARING 15°.

FIGURE 4

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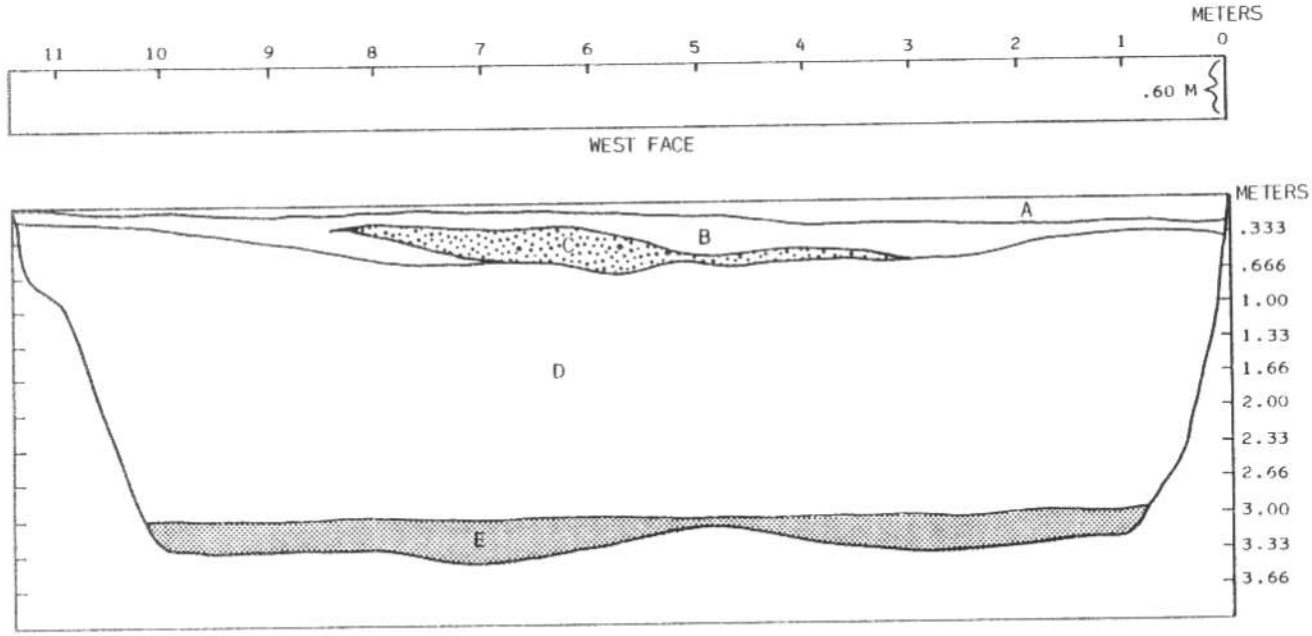

A DRY SANDY CLAY
B SAND LENS, TAN (SOME SHELLFISH REMAINS)
C SANDS, GRAVEL AND SHELLFISH REMAINS POORLY SORTED
D COMPACT, CONCRETED CLAYS, DK GRAY TO GRAY
E STANDING WATER

TRENCH 2. CORPS OF ENGINEERS/TELEGRAPH CANYON CREEK; COMPASS BEARING 40°.

FIGURE 5

remains (poorly sorted) as shown in Figure 5. Underlying all of the above was a strata of compact, concreted clays (dark gray to gray).

- Trench 3

Observation of sidewall profiles in this test trench provided the most complex stratigraphy noted during the course of the current investigation. A total of seven strata were observed, excluding the recent subsurface sewer easement (as shown in Figure 6) and the occurrence of standing water at a depth of 3.1 meters (10.1 feet). Surface soils were primarily dry, sandy clays to an approximate 15 centimeters (6 inches), followed by concreted clays with limited shellfish remains to depths ranging from 20 to 50 centimeters (7.8 to 19.6 inches). Between these and the lowest strata occurring from 1 meter to 3.5 meters, four additional lenses were recorded. These are severely unstable (i.e. mixed) strata of sands, shellfish remains, and marbled sands and dark gray clays (Figure 6).

No prehistoric or historic cultural resources were noted in any portion of Trench 3. As discussed in Attachment B of this report, the strata suggests that the surface soils in this region were constructed of introduced fills overlaying tidal marsh lands.

- Trench 4

As with the previous three trenches discussed, Trench 4 exhibited an absence of prehistoric or historic cultural debris.

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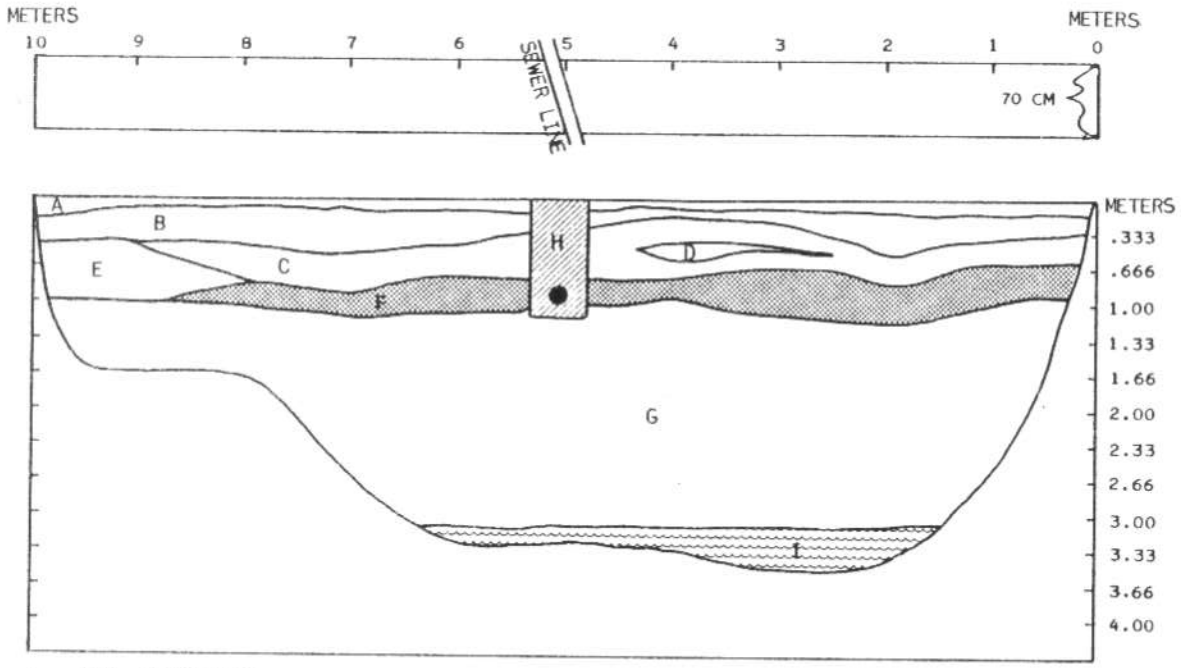


A. DRY, SANDY CLAY
B. CONCRETED CLAY (WITH SOME SHELLFISH REMAINS)
C. SAND, SHELLFISH REMAINS AND CLAY (LT. BROWN)
D. SAND SHELLFISH REMAINS AND CLAY (CMNT. GREY)
E. SAND, SHELLFISH REMAINS AND CLAY (DK. BROWN)
F. MARBLED SAND AND DK. COMPACT CLAYS
G. DK. COMPACT CLAYS FROM DK. BROWN TO LT. BROWN
H. SDG&E SEWER LINE (AND DISTURBED AREA)
I. STANDING WATER

TRENCH 3. CORPS OF ENGINEERS/TELEGRAPH CANYON CREEK; COMPASS BEARING 40°.

FIGURE 6

No evidence of past human activities was observed, and geologic analysis (Attachment B) strongly suggests that this area was salt marsh prior to landfill operations.

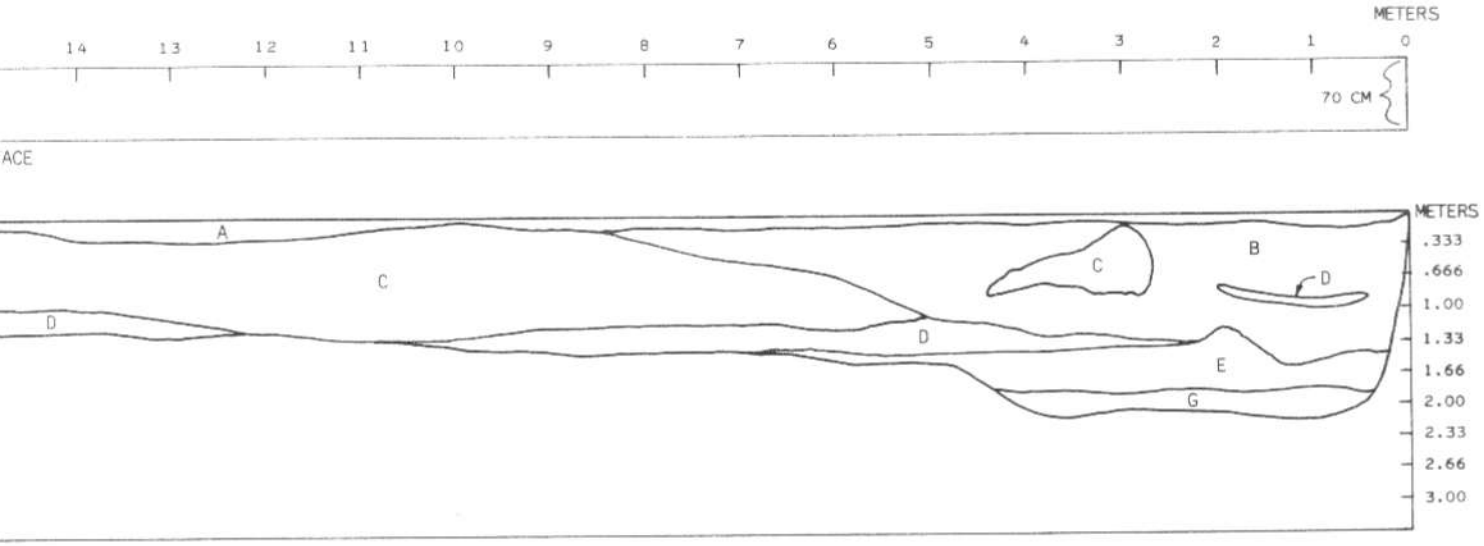
Excavated to a depth of 2.3 meters (7.5 feet), groundwater (encountered at 1.8 meters) precluded visible examination beyond this depth. Stratigraphically, the trench exhibited a total of five strata ranging from compact clays with cobble and shellfish inclusions to a crystalline lens first noted between 1.3 and 1.6 meters (4.2 to 5.2 feet) deep (Figure 7). These strata are geologically described in Attachment B of this report.

6.0 ANALYSIS OF TEST RESULTS

Because the test trench excavations produced no cultural debris in either the backfill or sidewall profiles, it may be suggested that no subsurface cultural resources are to be found along that portion of Telegraph Canyon Creek west of Interstate 5 and east of San Diego Bay. In support of this hypothesis are the findings of previous research (Leach 1975a:20) and geologic interpretation of the current test trench excavations (see Attachment B).

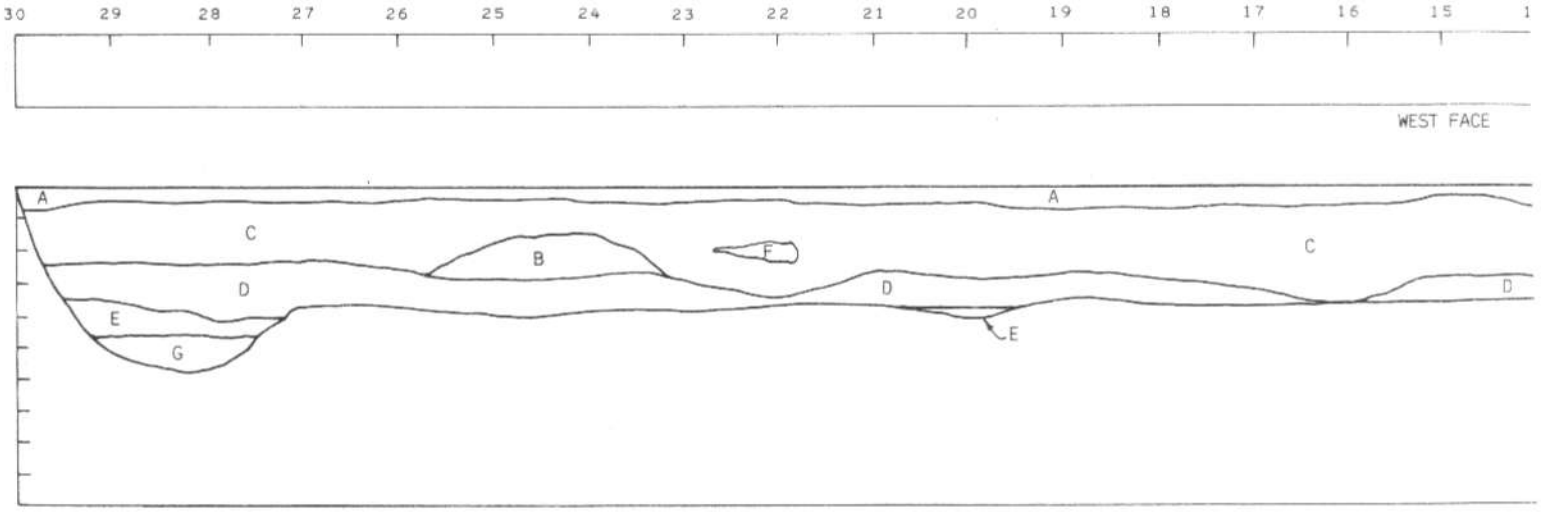
7.0 POTENTIAL ADVERSE IMPACTS

The potential for adverse impacts to known or suspected cultural resources was well documented in the previous environmental impact report prepared in conjunction with the proposed Telegraph Canyon flood control project (Leach 1975a:25-27). With regard to unsuspected, buried subsurface deposits, test trenching along the western reaches of Telegraph Canyon Creek was conducted



TRENCH 4 Corps of Engineers/Telegraph Canyon Creek; compass bearing 20°

FIGURE 7



A. COMPACT GREY CLAY WITH COBBLES & SHELLFISH REMAINS
B. DK. COMPACT CLAY
C. SAND MARBELED DK. CLAY
D. SAND LENS
E. CRYSTALINE LENS
F. SAND AND SHELL POCKET
G. STANDING WATER

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with negative results. No subsurface cultural deposits were either exhumed in the trenching process nor noted in the trench sidewalls for any of the trenches excavated (discussed in detail in Sections 5.0 and 6.0 of this report).

The remaining potential for adverse impacts to unsuspected, buried subsurface cultural deposits is slight. Analysis of the strata profiles and soil samples substantiates the probability that this acreage subjected to archaeological investigation has been constructed of land fill overlying natural tidal marshlands. However, the nature of the limited testing procedures precludes any absolute determination with regard to the lack of subsurface cultural strata along the untested portions of channeled creek-bed.

8.0 RECOMMENDED MITIGATING MEASURES

As no adverse impacts to cultural resources (surface or subsurface) are expected, no measures to mitigate identified impacts need be recommended. In the event that unsuspected cultural resources are encountered during the course of project construction, a qualified archaeologist should be consulted to evaluate the remains. Such evaluation may require that project construction be halted along that portion of the project and not resume until such time as adequate measures have been taken to ensure the mitigation of any identifiably adverse impacts.

On the basis of previous cultural resource surveys (Leach 1975a) and the current subsurface investigations, it is expected that no cultural resources (e.g. historic of prehistoric sites) will be impacted by the proposed Telegraph Canyon flood control project.

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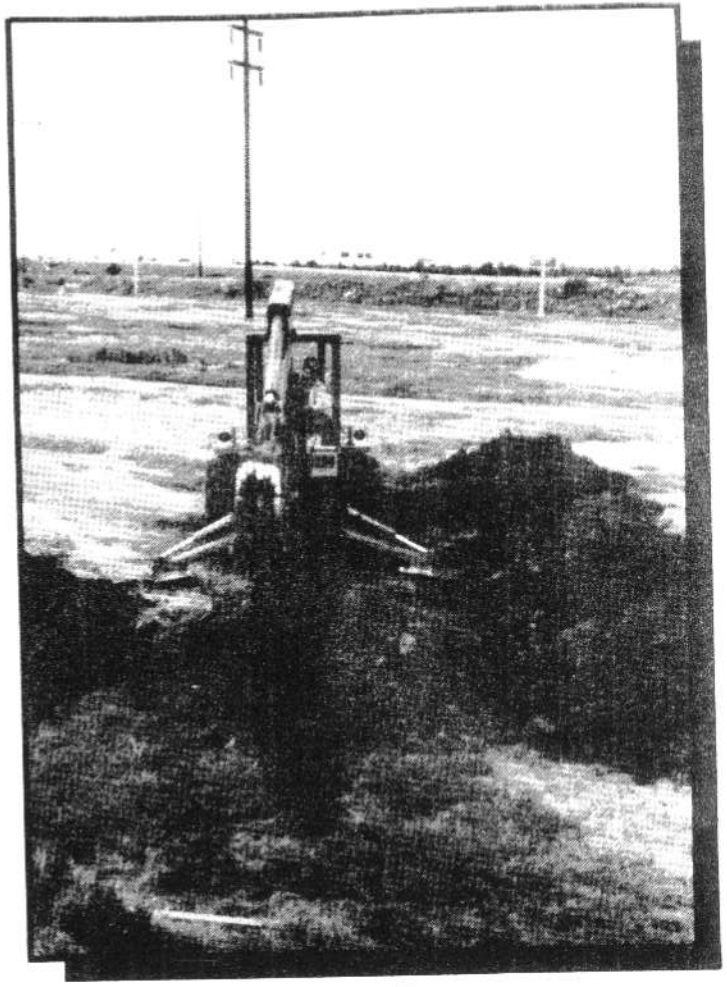
Attachment A

PHOTO RECORD

A



B

A: Backhoe Operations, Trench 1; Excavation From 1.5 Meters To Trench Bottom.
B: Backhoe Operations, Trench 1; Excavation From 1.5 Meters to Trench Bottom.

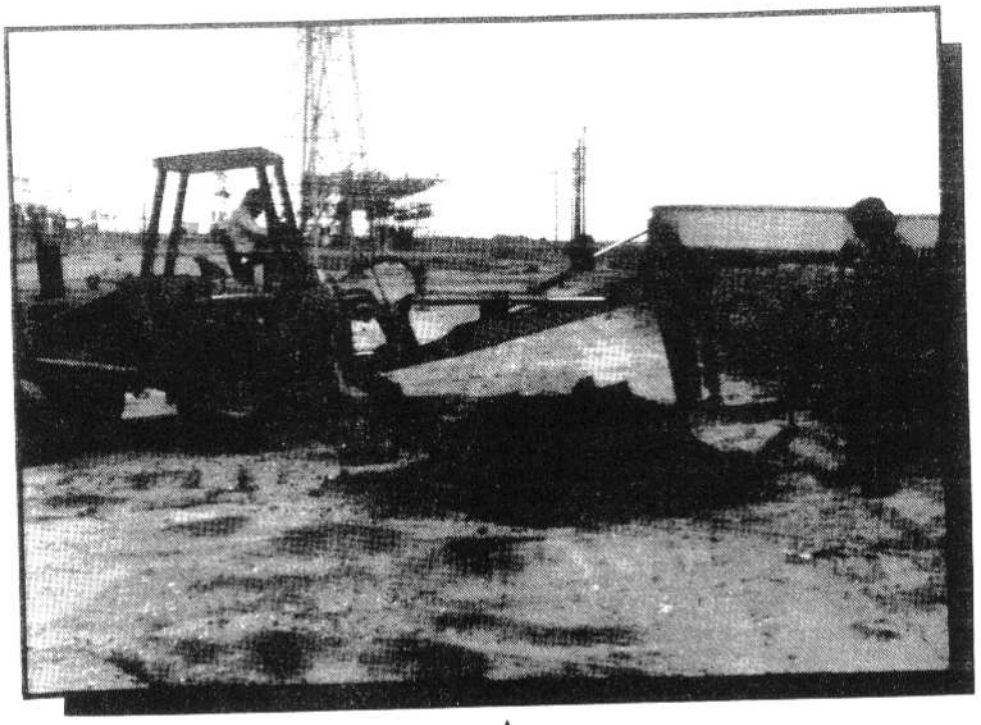
FIGURE 1

A

B

A: Trench 1 Operations; Trench Depth 3.1 Meters (10.17 Feet).
B: Backhoe Operations; Trench 1; Completed Trench.

FIGURE 2



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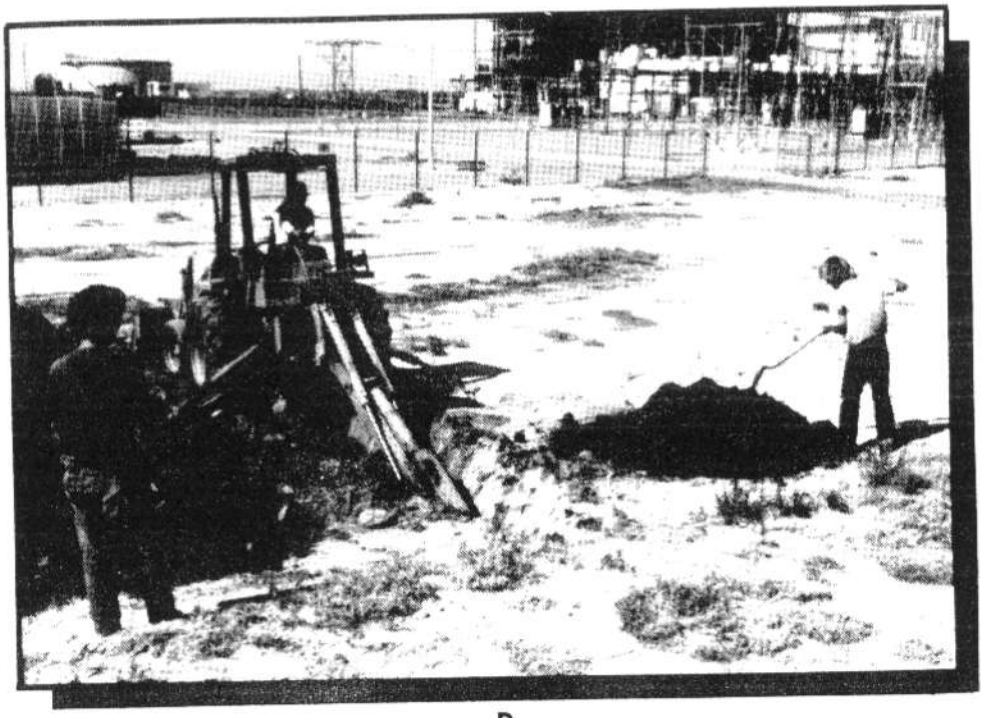

B

A:Backhoe Operations,Trench 2;Surface To 1.5 Meters Deep.
B:Backhoe Operations,Trench 2;1.5 Meters to Trench Bottom.

FIGURE 3

A

Backhoe Operations, Trench 2; General View.

FIGURE 4

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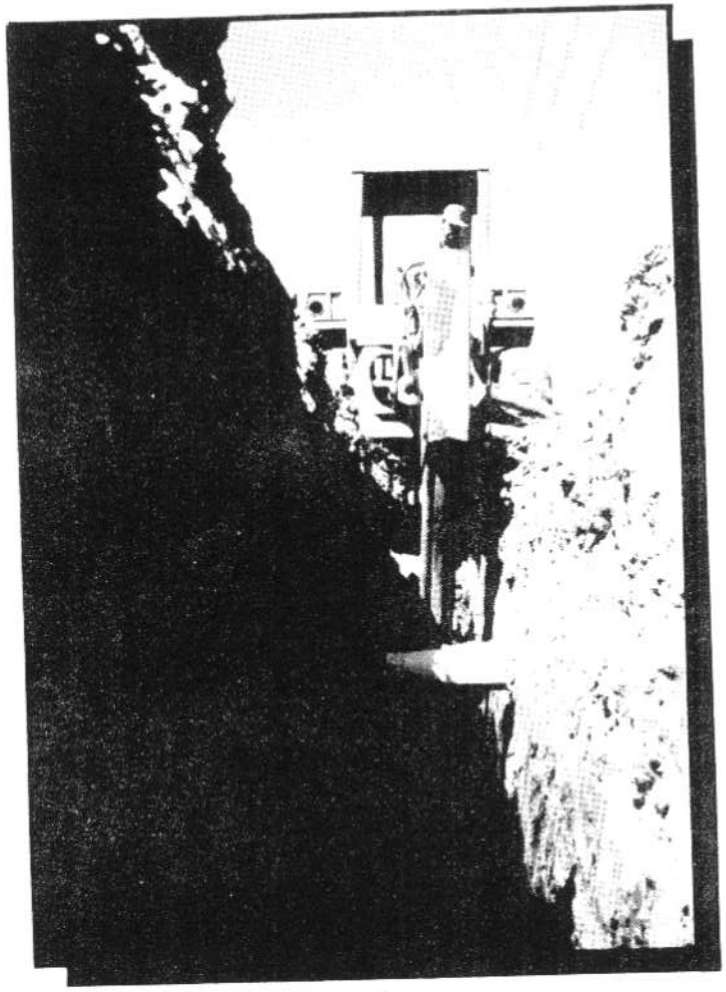
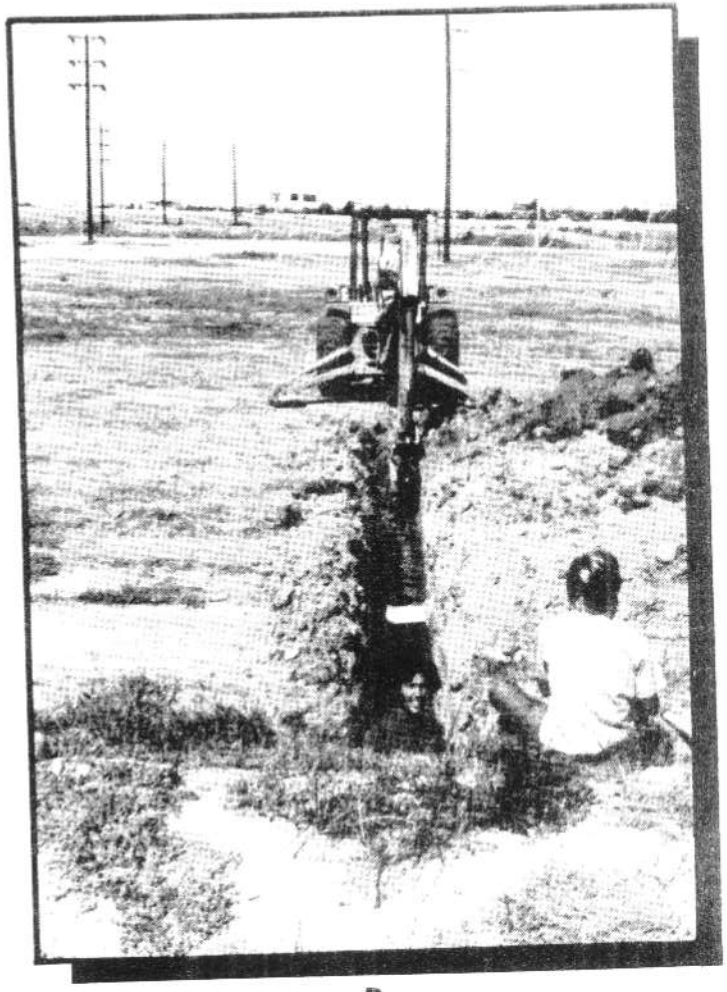


A



B

A: Backhoe Operations, Trench 3; General View of Trench and Exposed Sewer Line.
B: Backhoe Operations, Trench 3; Soil Sampling Operations and Preparation For Sidewall Profiles.

FIGURE 5

WESTEC Services, Inc.

A

B

A: Backhoe Operations, Trench 4; Commencement of Trenching (Surface To Trench Bottom).
B: Backhoe Operations, Trench 4; Completion of Trenching (Surface To Trench Bottom).

FIGURE 6

Attachment B

A GEOLOGIC EXAMINATION OF TEST TRENCH EXCAVATIONS AT TELEGRAPH CANYON, CHULA VISTA, CALIFORNIA

Examination of backhoe trenches was conducted in order to determine probable depositional environments of the strata encountered. Measured sections in all four trenches were covered by .5 to .7 meters of a massive yellowish fine to medium sand which contained variable proportions of gravel dispersed throughout and is typically characterized by whole Turitella shells and fragmented mollusk shell remains. This surficial material represents what is shown by Kennedy and Tan (1977) as quarternary alluvium and slopewash and as artificial fill. Older maps (Ellis and Lee, 1919; Plate VI) are on a topographic base which shows this area as marshes and tidal flats. This topographic base was surveyed in 1902. The only plausible conclusion is that this material represents an historic fill.

Sediments exposed in trenches beneath the artificially emplaced surficial covering represent deposits formed in the marshes and beaches shown on the older maps. Massive muds and muddy fine sands exposed in Trenches 1, 2 and 4 represent lagoonal deposits, whereas laminated fine to medium sands in Trenches 3 and 4 represent beach deposits. More precise paleoenvironmental interpretations could be made by conducting pollen analysis on some of the organic rich clayey laminae.

Evidence that the entire area changed local environments drastically from time to time is provided in Trench 4 where a .15 meter thick layer of selenite crystals were encountered. This layer is underlain by lagoon muds and is overlain by beach sands.

This selenite could only have formed in a closed evaporating basin which was periodically flushed with fresh sea water providing a source for the calcium sulfate but preventing the sodium chloride from concentrating and precipitating. The presence of laminated sands above the selenite suggests that this deposit may represent a natural occurrence as opposed to the buried remains of a previous salt evaporating pond such as may have accompanied the La Punta salt works around 1900 or the works of the Western Salt Company since 1869 (Weber, 1963).

TEST PIT LOG

DATE 14 Sept 78

CLIENT

SITE LOCATION

TEST LOCATION Trench 1

SHEET ___ OF ___

W.O. 3547

FIELD ENGR. ___

M DEPTH	MATERIAL DESCRIPTION		SAMPLES TAKEN TYPE	DRY DENSITY	MOISTURE CONTENT
	Moderate yellowish brown massive pebble to cobble bearing, carbonate speckled silty fine sand.	.65	Bulk 1-1		
.65	Dusky yellowish brown massive carbonate mottled silty fine sand.	.95	1-2		
1.6	Dark yellowish brown massive carbonate mottled silt and clay bearing fine sand. Occasional charcoal fragments.	1.2+	1-3		
.28	Bottom of Trench				

TEST PIT LOG

DATE 14 Sept 78

CLIENT

SITE LOCATION

TEST LOCATION Trench 2

SHEET ___ OF ___

W.O. 3547

FIELD ENGR.

M DEPTH	MATERIAL DESCRIPTION		SAMPLES TAKEN TYPE	DRY DENSITY	MOISTURE CONTENT
	Dusky yellow massive mollusk and gastropod, granule to pebble bearing silty medium sand. Contains mud balls and bone fragments.	.5	Bulk 2-1		
.5	Olive black massive granule bearing silty muddy fine sand.	1.1	2-2		
1					
1.6	Dark yellowish brown massive coarse sand bearing fine sand.	1.7	2-3		
2					
2.8	Groundwater Level				
3	Bottom of Trench				
4					

TEST PIT LOG

DATE 14 Sept 78

CLIENT

SITE LOCATION

TEST LOCATION Trench 3

SHEET ___ OF ___

W.O. 3547

FIELD ENGR. ___

M DEPTH	MATERIAL DESCRIPTION		SAMPLES TAKEN TYPE	DRY DENSITY	MOISTURE CONTENT
	Moderate yellowish brown massive, unconsolidated pebble to cobble bearing medium sand. Contains rare gypsum crystal and "chunks" of powdry calcium carbonate.	.7	3-0 3-1		
.7 1	Laminated dark greenish gray (weathering dark yellowish brown) and dark gray to black fine sand. Contains interbeds of organic rich clay.	1.1	3-2 Bulk 3-3		
1.8 2	Very thick bedded grayish brown coarse sand to granule bearing muddy very fine sand. Contains an occasional calcium carbonate spec.	1.6	3-4		
2.9 3	Groundwater Level				
3.4 4	Bottom of Trench				

TEST PIT LOG

DATE 14 Sept 78

CLIENT

SITE LOCATION

TEST LOCATION Trench 4

SHEET ___ OF ___

W.O. 3547

FIELD ENGR. ___

M DEPTH	MATERIAL DESCRIPTION		SAMPLES TAKEN TYPE	DRY DENSITY	MOISTURE CONTENT
.5	Yellow gray gastropod and mollusk and pebble to cobble bearing medium sand.	.5	4-1 Bulk		
	Yellow gray massive fine sand with extensive grayish brown sandy mud interbeds.	.5	4-2		
1	Laminated yellow gray medium sand.	.65	4-3		
	Slightly sandy intergrown selenite (gypsum) crystal bed.	.15			
1.8	Massive muddy sand. Groundwater level				
2	Bottom of Trench				
3					
4					

REFERENCES CITED

Bull, Charles

1973 An archaeological survey of the Sweetwater River flood control channel. Unpublished manuscript on file at Department of Anthropology, San Diego State University.

Bull, Charles

1977 SDM-W-1323. Archaeology of a site on Gunpowder Point. Unpublished manuscript on file at City of Chula Vista, California.

Carrico, Richard L.

1976 An archaeological survey of the Bayfront Redevelopment Project. Unpublished manuscript on file at City of Chula Vista, California.

Ellis, A.J., and C.H. Lee

1919 Geology and Groundwaters of the Western Part of San Diego County, California; U.S. Geologic Survey, Water-Supply Paper 446.

Kennedy, M.P., and S.S. Tan

1977 Geology of National City, Imperial Beach, and Otay Mesa Quadrangles, Southern San Diego Metropolitan Area, California; California Division of Mines, Map Sheet 29.

Leach, Larry L., Ph.D.

1975a A cultural impact survey of Telegraph Canyon Creek, San Diego County, California. Prepared by Tim Cross, Supervisory Archaeologist. Unpublished manuscript on file at San Diego State University, San Diego, California.

Leach, Larry L., Ph.D.

1975b Archaeological investigations at the Handy Man site, CAL E:8:17, and the Edgemore site, CAL E:8:17. Unpublished manuscript on file at Department of Anthropology, San Diego State University.

Weber, F.H., Jr.

1963 Mines and Mineral Resources of San Diego County, California; California Division of Mines, County Report 3.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-37-017656
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Page 1 of 3 *Resource Name or #: (Assigned by recorder) 1196 Industrial Boulevard

P1. Other Identifier:

*P2. Location: ☒ Not for Publication ☐ Unrestricted *a. County San Diego
and P2c, P2e, and P2b or P2d. (Attach Location Map as necessary.)
*b. USGS 7.5′ Quad Imperial Beach Date 1967 (1975) T 18S ; R 2W: Unsectioned ; S B B.M.
c. Address 1196 Industrial Boulevard City Chula Vista Zip 91911
d. UTM: (Give more than one for large and/or linear resources) Zone: 11 ; 492000 mE/ 3607225 mN
*e. Other Locational Data: (E.g., parcel #, directions to resource, elevation, etc., as appropriate.) Parcel Number 617-072-08

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)
This is a one story residence with a detached double garage and a small gas station set on a corner lot. All three structures exhibit a mission revival architectural style and are wood framed with a stucco exterior. The flat to very low pitched parapet roofs are covered with rolled asphalt material. The house is rectangular in plan. The parapet is stepped at all four corners, clay pipe drains are paired on the north, south, and east facades, with metal roof drains on the west side. The foundation is raised pier and beam with a perimeter wall. The main entrance, accessed by three concrete steps, is offset on the east facade. A stuccoed canopy supported by stepped brackets is covered with ceramic tiles. The wooden door is a single panel with one lite above. A back door at the west end of the south facade is accessed by wooden steps with railings. The windows are single and paired wooden 1/1 double hung with wooden sills and sash. A small hot water closet with a narrow wooden door is attached on the west side. *(Continued on attached sheet)*

*P3b. Resource Attributes: (See attributes and codes) HP2, HP4

*P4. Resources Present: ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo:
(View, date, accession #) Northwest, 7/16/99, 9999.1-1-CP-1 Exp. 8
*P6. Date Constructed / Age and Sources: ☒ Historic ☐ Prehistoric ☐ Both
1920s-1950s
*P7. Owner and Address:
Stephen and Helen Murphree Family Trust
753 Dorothy St.
Chula Vista, CA 91911
*P8. Recorded by: (Name, affiliation, and address)
C. Dolan, L. Lilburn in consultation with
Karen Weitze, Ph.D.
KEA Environmental, Inc.
1420 Kettner Blvd. Ste 620
San Diego, CA 92101
*P9. Date Recorded: 7/16/99
*P10. Survey Type: (Describe) Intensive

*P11. Report Citation: (Cite Survey report and other sources, or enter "none.") Dolan, Christy. Historic Property Survey Report for the Palomar Street Improvement Project, San Diego County, Chula Vista, California. Report submitted to City of Chula Vista by KEA Environmental, Inc. 1999.

*Attachments: ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Linear Resource Record ☐ Archaeological Record ☐ District Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List)

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # P-37-017656
HRI #I

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRPH Status Code 6Z
*Resource Name or # (Assigned by recorder) 1196 Industrial Blvd.

B1. Historic Name: Bowman's Garage

B2. Common Name:

B3. Original Use: Gas Station

B4. Present Use: Residence

*B5. Architectural Style: Mission Revival

*B6. Construction History: (Construction date, alterations, and date of alternations.) The house and gas station appear to have been built in the late 1920s and are shown on a 1928 aerial photograph. The two-car garage is a later addition and was probably built in the late 1950s. It shows up on a 1958 aerial photograph. Current resident reports that garage and gas station have been accidently hit by cars in the past. The house was also hit in the 1980s and was moved several inches off its foundation.

*B7. Moved? ☒No ☐Yes ☐Unknown Date: Original Location:

*B8. Related Features:

B9a. Architect: Unknown

B9b. Builder: Unknown

*B10. Significance: Theme Early gas station architecture Area Southwest
Period of Significance 1920-1940 Property Type Gas station Applicable Criteria N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

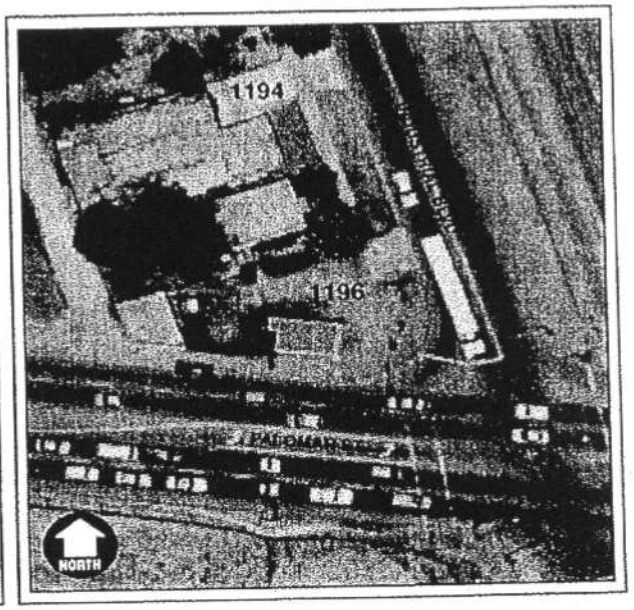
Gas stations like the one in the current study area were increasingly common toward the end of the 1920s, although it is somewhat unusual that a gas station such as this exists in an urban setting (it is more common to see old stations like this in rural towns). In the late 1920s, downtown Chula Vista showed a marked increase in gas stations (City Directories: 1920-1930). The automobile industry was beginning develop at this time and even the downtown San Diego residences were slowly being pushed out by automotive enterprises. Use of Spanish Colonial and Mission Revival architecture was not uncommon in these early stations and extant examples exist throughout the United States and California. *(Continued on attached sheet.)*

B11. Additional Resource Attributes: (List attributes and codes):

*B12. References:
Aerial Photographs, 1928 and 1958; USGS Quadrangle Maps, Various years;City Directories, 1915-1965;Alexander Platt Map, 1912; Guenter Horn, current resident of 1196 Industrial Blvd., Personal communication July 1999; Ana Arciniaga, resident of 1194 Industrial Ave., Personal communication July 1999

B13. Remarks:

*B14. Evaluator: C. Dolan, L. Lilburn in consultation with Karen Weitze, Ph.D.
KEA Environmental, Inc.
1420 Kettner Blvd., Suite 620
San Diego, CA 92101



(This space reserved for official comments.)

*Required Information

*Date of Evaluation: July 1999

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-37-017656
HRI #
Trinomial

*Resource Name or # (Assigned by recorder) 1196 Industrial Blvd.

*Recorded by: C. Dolan, L. Lilburn in consult. w/Karen Weitze *Date: July 1999 ☒ Continuation ☐ Update

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The double garage is square in plan. The parapet roof is stepped at the northeast and southeast corners connected by a low arch. The door is horizontal boards with a wooden jamb. An entry door is located on the north side. The building is set on a poured concrete slab. The gas station is rectangular in plan with a small projection on the west facade. It is oriented at an angle to the street on the corner lot on which it sits. The parapet roof is stepped at the four outside corners. An arch connects the raised corners on the east facade. A metal roof drain is on the west side. A wide overhang, supported by a stucco-covered wooden post, connects the building to the pump island. The pumps have been removed. The main entry is centered on the east facade flanked by single wooden 1/1 double hung windows with wooden sash and sills. The door is wooden with three horizontal panels and a single lite above. The windows have been boarded over. A back door is located on the south face of the small room projection on the west facade. A single 1/1 double hung window is offset on the north facade. The foundation is poured concrete slab with a small pad at the entrances. The landscaping is mature around the house and garage with a low perimeter wall and sidewalk around the front and south side. The driveway to both the garage and gas station is dirt.

The surrounding area is mostly residential. The structures are in fair to good condition. Pumps have been removed, windows boarded over, iron bars over windows. Current resident reports that garage and gas station have been accidently hit by cars in the past. The house was also hit in the 1980s and was moved several inches off its foundation.

*B10. Significance: Theme Early gas station architecture Area Southwest
Period of Significance 1920-1940 Property Type Gas station Applicable Criteria N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The gas station at 1196 Industrial Boulevard does not appear to qualify for listing in the National Register of Historic Places or the California Register of Historical Resources. It is not a distinguished example of a type, period, or method of construction and has no known association with events or persons important to our history. It does not appear to have had a lasting impact on local history. KEA staff spoke to several people who were either long-time residents or were knowledgeable in the local history and none of them could provide much information on the property (personal communications with Susan Painter at the Chula Vista library, long-time resident John Rojas, and the attendant at the Chula Vista Heritage Museum). Based on archival sources, it also does not appear to have served a significant role in the community. The station itself is only listed in the City Directories for one year (1929) even though Ana Arciniaga remembers that the station was there when she was a child in the 1940s.

The integrity of the property at 1196 Industrial Boulevard has been compromised in regards to its feel and setting. Its original setting was rural and its original purpose was to serve a largely rural population. These have been severely altered since the 1920s due to the near disappearance of agricultural fields, the development of an urban residential/commercial neighborhood, and the presence of the newer two-car garage. It is no longer used as a gas station and the ancillary elements, such as gas pumps, have been removed from the site.

For these same reasons, the structures are not eligible for the California Register of Historical Resources. They are not associated with events or persons that contribute to California history. They are not outstanding examples of Mission Revival architecture and their integrity has been somewhat compromised in regards to its setting and feeling.

*Required Information
99-991BSO-1.frm

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Hazardous Materials Management
Author: Alvin Greenberg

BACKGROUND

Aqueous ammonia will be used in the Selective Catalytic Reduction (SCR) process to control oxides of nitrogen. The AFC does not clearly state the frequency of aqueous ammonia deliveries, as page 8.12-10 of the Hazmat section states that there would be 1-2 trucks per week while table 8.10-6 of the Traffic section states that there would be 1-2 trucks per month. Also, the size (capacity) of the delivery trucks is not stated.

Additionally, optional hazmat transport routes are given, but it is stated that the exact route will be specified once the shipper contacts the California Highway Patrol (CHP) and applies for a license.

Staff needs more specific information on the frequency of delivery, the capacity of the delivery tanker, and the preferred route(s) from the supplier to the facility in order to evaluate potential impacts at intersections in the vicinity of the site.

DATA REQUESTS

71. Please provide the following information regarding the transportation of aqueous ammonia:

    a. the frequency of aqueous ammonia deliveries on a per week, per month, and per year basis;

    Response: Section 8.12, Hazardous Materials, inadvertently stated ammonia would be delivered 1 to 2 times per week. Section 8.10, Traffic and Transportation, identified the correct number of deliveries of ammonia. Ammonia will be delivered to the site approximately every other week, approximately 2 times per month, and approximately 24 times per year.

    b. the size (capacity) of the delivery trucks; and

    Response: The delivery trucks will be approximately 7,500 gallons in size, but are filled to 6,000 gallons of aqueous ammonia for deliveries.

    c. the specific highways and streets on the preferred route(s) from the supplier to the facility.

    Response: The preferred route for ammonia deliveries is identified in Section 8.10.4.4 Transport of Hazardous Materials. The preferred and alternative routes are as follows:

    The preferred ammonia transportation route is from I-5 south, exit at J Street, travel west along J Street, south on Bay Boulevard to the SBRP site. This route requires a left turn at J Street and Bay Boulevard intersection, which is controlled by four-way stop signs. An alternative ammonia transportation route is from I-5, exit at L Street and making a left turn onto Bay Boulevard, then travel south on Bay Boulevard to SBRP. This alternative route requires a left turn from L Street onto Bay Boulevard. The intersection of L Street and Bay Boulevard is not signalized, but is controlled with a stop sign at L Street and

Bay Boulevard, and by a stop sign on northbound Bay Boulevard at the intersection with L Street.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Section: Land Use
Author: Amanda Stennick

BACKGROUND

As stated in the AFC, the SBRP site is within the planning area of the Chula Vista Bay Master Plan (CVBMP). The CVBMP planning process was initiated in January 2003 and is a joint planning effort of the San Diego Unified Port District (Port), City of Chula Vista/Redevelopment Agency of the City of Chula Vista, and Pacifica Companies. Land use planning responsibility for the master plan area is divided between the Port and City. The Port is the lead agency for CEQA review of this planning effort and the City is a responsible agency. The CVBMP will guide the development of the bay front over a 20-year period. The mix of proposed land uses includes parkland, open space, environmental buffers, civic/cultural, hotel, office, residential, retail and entertainment, and recreational uses. The Draft Environmental Impact Report (DEIR) on the CVBMP was released for public review in October 2006.

As stated in the DEIR, implementation of the CVBMP will require discretionary actions by the Board of Port Commissioners, Chula Vista City Council and Redevelopment Agency, and other agencies. Such discretionary actions include: amendments to the Port Master Plan, City of Chula Vista General Plan, and City Local Coastal Program (including the Local Coastal Plan and Specific Plan); coastal development permits; a land exchange; a financial participation agreement between the Port and the City and other types of related agreements; associated development permits; and State/Federal permits and actions/approvals.

DATA REQUEST

72. To help staff determine whether the CVBMP will be adopted prior to staff's Final Staff Assessment, please provide a timeline of expected actions for each local, state, and federal agency involved in the CVBMP. Please list each agency (e.g. Coastal Commission), state the action(s) they will take to implement the CVBMP, the expected time frame for all discretionary actions, and how the agency's action will be relevant to the SBRP project.

    Response: As the Chula Vista Bayfront Master Plan (CVBMP) is being developed jointly by the San Diego Unified Port District (Port) and the City of Chula Vista, the Port not the Applicant is in the best position to provide the timeline of expected actions by local, state and federal agencies as part of the discretionary actions associated with the adoption of the CVBMP. Therefore, as requested in the letter provided as Attachment LAND-72A, dated November 9, 2006 from the Applicant to the San Diego Unified Port District, the Port provided a table (see Attachment LAND-72B) that provides, from the Port's perspective, the expected timeline for the discretionary actions for adoption of the CVBMP, and the relevance of the CVBMP to the SBRP project.

BACKGROUND

The Chula Vista Local Coastal Program (LCP) provides a detailed plan for the orderly growth, development, redevelopment, and conservation of the Chula Vista Local

Coastal Zone. As such, the LCP must be consistent with local and state land use policies.

73. Please provide a discussion of how the SBRP would comply with the Chula Vista Local Coastal Plan (LCP).

Response: Please refer to the AFC Volume 2, Appendix 8.4, Table 8.4A-2 for a discussion of how the SBRP would comply with the Chula Vista Local Coastal Plan (LCP).

74. If the CVBMP is not adopted prior to the completion of the Energy Commission's licensing process for the SBRP, please state which land use plan(s) would be applicable to the SBRP site. Please expand on the discussion in the AFC's Land Use detailing how the SBRP would comply with all relevant land use plans and policies.

Response: Please refer to Section 8.4.1 of the AFC for a discussion of the land use plans applicable to the SBRP site in the event the CVBMP is not adopted prior to completion of the CEC licensing process for the SBRP.

BACKGROUND

Section 30260 of the Coastal Act provides guidelines for the development of new or expansion of existing coastal dependent industrial facilities. There is no discussion in the SBRP AFC on this section of the Coastal Act.

DATA REQUEST

75. Please describe how the proposed project conforms to Section 30260 of the Coastal Act as it pertains to coastal dependent industry and the location or expansion of industrial development.

Response: The Applicant has sought guidance from the California Coastal Commission staff (CCC staff) regarding how the coastal dependency policy applies in the unique circumstances of the SBRP given that it: 1) is replacing an existing once-through cooled generating facility located in the coastal zone at an adjacent site; 2) is consistent with, and critical to, a major local planning process (e.g. the Chula Vista Bayfront Master Plan); and 3) would reduce or eliminate existing coastal and marine impacts. CCC staff has reviewed the AFC, the potentially relevant planning and zoning requirements (e.g. the Bayfront Master Plan, the Chula Vista Local Coastal Plan, etc.) and all of the requirements of Chapter 3 of the Coastal Act (including, but not limited to, Section 30260). Based on this review, CCC staff has advised the Applicant of their preliminary conclusion that the SBRP appears to conform to both local requirements and, pending the resolution of several issues, can likely be found to comply with the policies of Chapter 3 of the Coastal Act (including Section 30260). Thus, CCC staff advises that, while they may raise other minor issues, coastal dependency should not be a significant issue for this project.

LS POWER GENERATION, LLC
1735 Technology Drive Suite 820
San Jose, CA 95110-1384
408-572-1300 main
408-392-9757 fax

November 9, 2006

Sent Via FEDEX

San Diego Unified Port District
3165 Pacific Highway
San Diego, CA 92101-1128

Attention: Randa Coniglio, Area Real Estate Manager

Subject: South Bay Replacement Project: CEC Staff Land Use Data Requests

Dear Ms. Coniglio:

As you are aware, on October 31, 2006, the California Energy Commission (CEC) issued Data Requests to LSP South Bay, LLC (LSP) regarding the Application for Certification (AFC) for the South Bay Replacement Project (SBRP). Data Requests are issued to the applicant as a means for CEC staff to obtain additional information or clarifications to information in the AFC. In accordance with CEC procedures, LSP will provide responses to the Data Request on or about November 29, 2006.

Included in the CEC staff's Data Requests is Land Use Data Request No. 72, which reads as follows:

> *72. To help staff determine whether the CVBMP will be adopted prior to staff's Final Staff Assessment, please provide a timeline of expected actions for each local, state and federal agency involved in the CVBMP. Please list each agency (e.g. Coastal Commission), state the action(s) they will take to implement the CVBMP, the expected time frame for all discretionary actions, and how the agency's action will be relevant to the SBRP project.*

While LSP has access to publicly available information on the Chula Vista Bayfront Master Plan, we believe the Port has the most up to date knowledge and background of its CVBMP process and accordingly, request that the Port provide such information. In this way, the CEC, public, and other agencies, would have the benefit of the best possible information regarding the Port's planning process and timeline for the CVBMP.

With this in mind, we request that the Port prepare and submit to us a response to Data Request #72. In keeping with the deadlines in the CEC process, we also request that this response be provided not later than November 22, 2006 so that it can be included in our response to the CEC.

If you have questions or would like to discuss this matter in more detail, please contact me directly.

Sincerely,

Kevin R Johnson

Kevin R Johnson
Vice President
LS Power Generation

CC: Ron Fischer

AAK/KRJ
This document has been signed on behalf of Kevin R Johnson (per his instructions) by Alexandra A Kennedy, Receptionist.

CHULA VISTA BAYFRONT MASTER PLAN
ANTICIPATED PROJECT APPROVAL TIMELINE
Prepared by the San Diego Unified Port District (11/28/06)

AUTHORIZING AGENCY	APPROVAL	ANTICIPATED TIMEFRAME*	RELEVANCE TO SBRP PROJECT
San Diego Unified Port District	Certification – CVBMP Environmental Impact Report	May/June 2007	CVBMP EIR contains environmental analysis on existing SBPP and limited analysis on proposed SBRP sites.
San Diego Unified Port District	Approval - CVBMP	May/June 2007	Land use approval for existing SBPP and proposed SBRP sites.
San Diego Unified Port District	Approval - SDUPD/ Private Developer Land Exchange	May/June 2007	None anticipated.
San Diego Unified Port District	Approval - Port Master Plan Amendment	July/August 2007	SDUPD land use designation approval for existing SBPP and proposed SBRP sites.
San Diego Unified Port District	Approval – Port tenant projects and/or lease agreements	April/May 2008 at earliest for Phase I projects only. 2012/2013 anticipated for SBRP project.	SDUPD approval for proposed project and/or lease on SBRP site.
San Diego Unified Port District	Approval - Coastal Development Permit Issuance	April/May 2008 at earliest for Phase I projects only. 2012/2013 anticipated for SBRP project.	SDUPD approval of coastal development permit issuance for proposed project on SBRP site.

AUTHORIZING AGENCY	APPROVAL	ANTICIPATED TIMEFRAME*	RELEVANCE TO SBRP PROJECT
City of Chula Vista	Approval - Chula Vista Bayfront Master Plan	(City to provide)	(City to provide)
City of Chula Vista	Approval - Bayfront Area Plan of the Chula Vista General Plan Amendment	(City to provide)	(City to provide)
City of Chula Vista	Approval - Land Use Plan of the Chula Vista Local Coastal Program	(City to provide)	(City to provide)
City of Chula Vista	Approval - Bayfront Specific Plan	(City to provide)	(City to provide)
City of Chula Vista	Approval - Bayfront/Town Centre I Redevelopment Plan	(City to provide)	(City to provide)
City of Chula Vista	Approval - Coastal Development Permit	(City to provide)	(City to provide)
City of Chula Vista	Approval - Habitat Loss Incidental Take Permit	(City to provide)	(City to provide)
California State Lands Commission	Approval - SDUPD/Pacifica Land Exchange	July/August 2007	None anticipated.
California State Lands Commission	Approval - Dredging Permit	Unknown – may not be needed until Phase III implementation	None anticipated.

AUTHORIZING AGENCY	APPROVAL	ANTICIPATED TIMEFRAME*	RELEVANCE TO SBRP PROJECT
California Coastal Commission	Certification - Port Master Plan Amendment	November/December 2007	Existing SBPP and proposed SBRP sites would be “annexed” into Port Master Plan with approved “Energy Utility Zone” land use designation on proposed SBRP site.
California Coastal Commission	Certification - City Local Coastal Program Amendment	November/December 2007	(City to provide)
U.S. Army Corps of Engineers	Approval - Clean Water Act Section 404 Permit	Unknown	May be needed for existing SBPP and proposed SBRP sites.
U.S. Army Corps of Engineers	Approval - Section 10 Rivers and Harbor Act Permit	Unknown	May be needed for existing SBPP and proposed SBRP sites.
California Department of Fish and Game	Approval - Title 14 of California Code of Regulations 1600 permit	Unknown	May be needed for existing SBPP and proposed SBRP sites.
Regional Water Quality Control Board	Approval - Clean Water Act Section 401 Permit	Unknown	May be needed for existing SBPP and proposed SBRP sites.

Notes:
(1) This table is based on information provided in Table 3-1 “Project Approvals” (page 3-10) and Section 2.4 “Intended Uses of this EIR” (page 2-19) of the CVBMP Draft Environmental Impact Report.
(2) Information in the “Anticipated Timeframe” column is the best information we have to date but is subject to change.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Public Health
Author: Alvin Greenberg

BACKGROUND

The AFC states that the Hot Spots Analysis and Response Model (HARP) model is used to assess cancer risk and chronic and acute impacts. In the opinion of staff, this is only partially true. The HARP model was used to derive potential cancer risk values for each pollutant and route of exposure, based on an exposure of 1.0 ug/m^3. These unit values were then combined with pollutant emission rates, and these weighted values were used in the AERMOD model to obtain actual cancer risks and hazard indices.

The AFC states: "AERMOD replaces the previously EPA-recommended model, Industrial Source Complex, Version 3 (ISC3), which has been used for many years for air quality impact analyses in CEC AFCs."

Staff needs certain data in order to independently confirm the Health Risk Assessment (HRA) results as found in the AFC.

DATA REQUESTS

76. Please provide the HARP transaction file (.tra) and/or the following information that was used in the HARP modeling:

- Stack parameters and locations in UTM coordinates

Response: No HARP transaction file (.tra) exists to send in response to this data request. This is because running the complete HARP model to create the transaction file would have been inconsistent with the SDAPCD's requirement that AERMOD be used for air dispersion modeling on this project. HARP (Version 1.2a from the ARB website) contains ISCST3 as its internal air dispersion model. Consistent with analyses submitted to and approved by the Commission in other siting cases, the Applicant used HARP in alternative mode (described in the HARP guidance document at described in the HARP How-To Guide[3]) to calculate appropriate health risk assessment parameters (e.g., inhalation cancer potency factors, noncancer chronic and acute RELs), and combined those parameters with maximum proposed emission rates of the toxic air contaminants, and dispersion factors calculated using AERMOD based on unit emission rates.

The stack parameters for the HRA AERMOD run are provided in Attachment PH-76A separately for the 1-hour averaging time used to calculate acute health hazard, and annual averaging time used to calculate cancer risk and chronic health hazard.

The stack UTM coordinates in Zone 11 of NAD27 are:

- West stack: E 491161.6 N 3607918.9
- East stack: E 491202.4 N 3607917.2

[3] ARB. *How to Perform Health Analyses Using a Ground-Level Concentration,* HARP How-To Guide, Topic 8, Part B, http://www.arb.ca.gov/toxics/harp/docs/howtos/Topic08.pdf, accessed November 17, 2006.

- Information on project buildings and tanks used in building downwash analysis (locations in UTM coordinates and dimensions)

  Response: The building dimensions are given in AFC Appendix 8.1, Table 8.1D-1, while their UTM coordinates are included in this response as Attachment PH-76B.

- Meteorological data used

  Response: As discussed above, the revised modeling will use Chula Vista meteorological data the SDAPCD provided to Sierra Research on October 26, 2006[4]. This dataset is provided electronically on compact disk (CD) as Attachment PH-76C. Five copies of the CD have been provided to the CEC. Additional copies will be provided upon request.

BACKGROUND

A map of the Maximum Exposed Individuals (MEIs) is provided, with Universal Transverse Mercator (UTM) coordinates, but the distances from the project site are not given. Staff needs these distances to complete its analysis of impacts.

DATA REQUESTS

77. Provide a table showing distances from the combustion turbine stacks to various receptors including the fence line, the cancer risk MEI, the acute hazard MEI, the chronic hazard MEI, the Points of Maximum Impact for cancer risk and acute & chronic hazards, and a few representative nearest sensitive receptors.

    Response: The requested distances are in Table AIR-77-1. Note that the tabulated distances are based on the air dispersion and health risk modeling presented in the AFC submitted June 30, 2006. Because of CEC and SDAPCD requests for remodeling with Chula Vista meteorological data, and for additional scenarios of simultaneous activities for both the proposed SBRP and the existing SBPP, new modeling will be conducted in the near future, which will most likely change the distances except those to the nearest fence line.

TABLE AIR-77-1
Distances from Each Stack to Specified Receptors (meters)

Receptor	West Stack	East Stack
Nearest fence line	32.3	32.2
Cancer Risk MEI (1)	625.8	590.1
Cancer Risk PMI (2)	625.8	590.1
Chronic Health Hazard MEI	625.8	590.1
Chronic Health Hazard PMI	625.8	590.1
Acute Health Hazard MEI	7,844.8	7,837.5

[4] The October 26, 2006 version uses wind profiler data to update the previous version of Chula Vista meteorological data provided to Sierra Research on August 31, 2006.

TABLE AIR-77-1
Distances from Each Stack to Specified Receptors (meters)

Receptor	West Stack	East Stack
Acute Health Hazard PMI	7,844.8	7,837.5
Durbin Family Day Care	1,663.9	1,623.2
Bay View Hospital	2,157.4	2,120.7
Carmen Daycare	1,099.6	1,064.6
Covenant Christian School	5,484.2	5,445.5

Notes:

MEI - Maximum Exposed Individual

PMI - Point of Maximum Impact

UTM coordinates are in the Zone 11 NAD27 datum

Table 76-1
Emission Rates and Stack Parameters for HRA

Equipment	Stack Diam, m	Stack Height m	Temp, deg K	Exhaust Flow, m^3/s	Exhaust Velocity, m/s	Stack Diam, ft	Stack Height ft	Exh Temp, Deg F	Exh Flow Rate, ft^3/min	Exhaust Velocity, ft/s
Averaging Period: 1-hour										
Gas Turbine 1	5.79	38.10	345.93	497.55	18.89	19	125	163	1,054,243	84
Gas Turbine 2	5.79	38.10	345.93	497.55	18.89	19	125	163	1,054,243	84
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	2.5	125	583	16,303	55
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	0.5	22	891	1,227	104
Averaging Period: Annual										
Gas Turbine 1	5.79	38.10	344.82	464.82	17.65	19	125	161	984,890	0
Gas Turbine 2	5.79	38.10	344.82	464.82	17.65	19	125	161	984,890	0
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	2.5	125	583	16,303	55
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	0.5	22	891	1,227	104

BPIP (Dated: 95086)
Duke Energy South Bay: 20 Bldgs, 5 Tanks, 4 Stacks

==========
BPIP PROCESSING INFORMATION:
==========

The ST flag has been set for processing for an ISCST2 run.

Inputs entered in METERS will be converted to meters using a conversion factor of 1.0000. Output will be in meters.

The UTMP variable is set to UTMY. The input is assumed to be in UTM coordinates. BPIP will move the UTM origin to the first pair of UTM coordinates read. The UTM coordinates of the new origin will be subtracted from all the other UTM coordinates entered to form this new local coordinate system.

Plant north is set to 0.00 degrees with respect to True North.

Duke Energy South Bay: 20 Bldgs, 5 Tanks, 4 Stacks

PRELIMINARY* GEP STACK HEIGHT RESULTS TABLE
(Output Units: meters)

Stack Name	Stack Height	Stack-Building Base Elevation Differences	GEP** EQN1	Preliminary* GEP Stack Height Value
STACK01	38.10	0.00	71.62	71.62
STACK02	38.10	0.00	71.62	71.62
FIRE	6.71	0.00	71.62	71.62
AUXBOIL1	38.10	0.00	71.62	71.62

* Results are based on Determinants 1 & 2 on pages 1 & 2 of the GEP Technical Support Document. Determinant 3 may be investigated for additional stack height credit. Final values result after Determinant 3 has been taken into consideration.
** Results were derived from Equation 1 on page 6 of GEP Technical Support Document. Values have been adjusted for any stack-building base elevation differences.

Note: Criteria for determining stack heights for modeling emission limitations for a source can be found in Table 3.1 of the GEP Technical Support Document.

TIME : 0: 0: 0

Duke Energy South Bay: 20 Bldgs, 5 Tanks, 4 Stacks

BPIP output is in meters

```
     SO BUILDHGT STACK01    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK01    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK01    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK01    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK01    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK01    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDWID STACK01    17.20   21.88   25.89   29.54   33.86
37.14
     SO BUILDWID STACK01    39.30   40.26   40.00   39.80   39.38
37.77
     SO BUILDWID STACK01    35.02   31.20   61.63   24.01   19.81
15.00
     SO BUILDWID STACK01    17.20   21.88   25.89   29.54   33.86
37.14
     SO BUILDWID STACK01    39.30   40.26   40.00   39.80   39.38
37.77
     SO BUILDWID STACK01    35.02   31.20   61.63   24.01   19.81
15.00
     SO BUILDLEN STACK01    39.80   39.38   37.77   35.02   31.20
27.49
     SO BUILDLEN STACK01    24.01   19.98   15.00   17.20   21.88
25.89
     SO BUILDLEN STACK01    29.54   33.86   58.51   39.30   40.26
40.00
     SO BUILDLEN STACK01    39.80   39.38   37.77   35.02   31.20
27.49
     SO BUILDLEN STACK01    24.01   19.98   15.00   17.20   21.88
25.89
     SO BUILDLEN STACK01    29.54   33.86   58.51   39.30   40.26
40.00
     SO XBADJ    STACK01   -40.79  -40.44  -38.85  -36.09  -32.24  -
27.40
     SO XBADJ    STACK01   -21.73   23.65   31.40   -5.77   -3.76   -
1.63
     SO XBADJ    STACK01     0.12    0.30    0.48    0.64    0.78
0.90
     SO XBADJ    STACK01     0.99    1.05    1.08    1.08    1.04   -
0.09
     SO XBADJ    STACK01    -2.29  -43.63   -6.40  -11.44  -18.12  -
24.26
     SO XBADJ    STACK01   -29.66  -34.16  -58.99  -39.94  -41.04  -
40.90
     SO YBADJ    STACK01    -2.83   -7.18  -11.31  -14.89  -17.23  -
19.05
```

```
     SO YBADJ    STACK01   -20.29  -29.02  -21.90  -20.89  -20.74  -
19.97
     SO YBADJ    STACK01   -18.58  -16.64    3.42   -9.72   -5.49   -
1.10
     SO YBADJ    STACK01     2.83    7.18   11.31   14.89   17.23
19.05
     SO YBADJ    STACK01    20.29   29.02   20.90   20.89   20.74
19.97
     SO YBADJ    STACK01    18.58   16.64   -3.42    9.72    5.49
1.10


     SO BUILDHGT STACK02    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK02    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK02    28.65   28.65   28.65   27.13   24.99
28.65
     SO BUILDHGT STACK02    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK02    28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT STACK02    28.65   28.65   28.65   27.13   24.99
28.65
     SO BUILDWID STACK02    17.03   21.54   25.89   29.54   33.86
37.14
     SO BUILDWID STACK02    39.30   40.26   40.00   39.80   39.38
39.14
     SO BUILDWID STACK02    36.43   32.61   61.63   90.85   89.66
15.00
     SO BUILDWID STACK02    17.03   21.54   25.89   29.54   33.86
37.14
     SO BUILDWID STACK02    39.30   40.26   40.00   39.80   39.38
39.14
     SO BUILDWID STACK02    36.43   32.61   61.63   90.85   89.66
15.00
     SO BUILDLEN STACK02    40.96   40.67   37.77   36.43   32.61
27.99
     SO BUILDLEN STACK02    24.36   19.98   15.00   17.20   21.88
25.39
     SO BUILDLEN STACK02    29.54   33.86   58.51  132.17  130.57
40.00
     SO BUILDLEN STACK02    40.96   40.67   37.77   36.43   32.61
27.99
     SO BUILDLEN STACK02    24.36   19.98   15.00   17.20   21.88
25.39
     SO BUILDLEN STACK02    29.54   33.86   58.51  132.17  130.57
40.00
     SO XBADJ    STACK02   -41.22  -40.99  -57.78  -36.84  -33.04  -
28.24
     SO XBADJ    STACK02   -22.58  -16.24   -9.40  -46.24  -42.68   -
1.31
     SO XBADJ    STACK02    -0.18   -0.10  -21.39   38.68   29.90
0.20
     SO XBADJ    STACK02     0.27    0.32   20.01    0.41    0.43
0.25
     SO XBADJ    STACK02    -1.77   -3.74   34.40   29.04   20.80  -
24.08
```

```
     SO XBADJ    STACK02   -29.36  -33.75  -37.11 -170.85 -160.46  -
40.20
     SO YBADJ    STACK02    -3.00   -7.30   24.87  -14.59  -16.82  -
18.54
     SO YBADJ    STACK02   -19.70  -20.26  -20.20  -26.30  -33.10  -
19.94
     SO YBADJ    STACK02   -18.62  -16.74  -31.07   46.22   55.31   -
1.90
     SO YBADJ    STACK02     3.00    7.30  -24.87   14.59   16.82
18.54
     SO YBADJ    STACK02    19.70   20.26   19.20   26.30   33.10
19.94
     SO YBADJ    STACK02    18.62   16.74   31.07  -46.22  -55.31
1.90


     SO BUILDHGT FIRE       27.13   27.13    6.10   28.65   28.65
28.65
     SO BUILDHGT FIRE       28.65   28.65    8.53    8.53    8.53
8.53
     SO BUILDHGT FIRE       27.13   27.13   27.13   27.13   27.13
27.13
     SO BUILDHGT FIRE       27.13   27.13    4.88   28.65    6.10
4.88
     SO BUILDHGT FIRE        4.88    8.53    8.53    8.53    8.53
8.53
     SO BUILDHGT FIRE       27.13   27.13   27.13   27.13   27.13
27.13
     SO BUILDWID FIRE       64.05   83.16   28.62   29.54   33.86
37.14
     SO BUILDWID FIRE       39.30   40.26   12.00   12.65   12.92
12.93
     SO BUILDWID FIRE      125.99  117.73  105.90   90.85   73.03
53.00
     SO BUILDWID FIRE       64.05   83.16   11.79   29.54  151.05
11.43
     SO BUILDWID FIRE       10.60   12.65   12.00   12.65   12.92
12.93
     SO BUILDWID FIRE      125.99  117.73  105.90   90.85   73.03
53.00
     SO BUILDLEN FIRE      127.38  130.89   34.85   36.43   32.61
27.99
     SO BUILDLEN FIRE       24.36   19.98   12.50   12.44   12.61
12.55
     SO BUILDLEN FIRE      113.29  123.40  129.75  132.17  130.57
125.00
     SO BUILDLEN FIRE      127.38  130.89   10.56   36.43  117.73
11.29
     SO BUILDLEN FIRE       10.85   12.41   12.50   12.44   12.61
12.55
     SO BUILDLEN FIRE      113.29  123.40  129.75  132.17  130.57
125.00
     SO XBADJ    FIRE     -162.80 -157.05  -57.40  -93.28  -94.52  -
92.89
     SO XBADJ    FIRE      -88.44  -81.31   10.40   11.43   11.72
11.65
     SO XBADJ    FIRE       23.14   28.85   33.68   37.48   40.15
41.60
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     SO XBADJ    FIRE       35.42   26.16   -6.09   56.85   -5.14   -
7.16
     SO XBADJ    FIRE       -7.08  -21.26  -52.40  -53.10  -52.40  -
24.20
     SO XBADJ    FIRE     -136.43 -152.24 -163.43 -169.65 -170.72 -
166.60
     SO YBADJ    FIRE      -34.62  -51.39   -4.95   19.38    6.83   -
5.93
     SO YBADJ    FIRE      -18.50  -30.51   -7.60   -4.60   -1.46
1.79
     SO YBADJ    FIRE      -68.56  -53.72  -37.25  -19.65   -1.45
16.80
     SO YBADJ    FIRE       34.62   51.39    1.86  -19.38   76.72
1.42
     SO YBADJ    FIRE        1.18   10.37    8.60    0.46   -7.69   -
1.79
     SO YBADJ    FIRE       68.56   53.72   37.25   19.65    1.45  -
16.80


     SO BUILDHGT AUXBOIL1   28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT AUXBOIL1   28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT AUXBOIL1   28.65   28.65   28.65   27.13   24.99
28.65
     SO BUILDHGT AUXBOIL1   28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT AUXBOIL1   28.65   28.65   28.65   28.65   28.65
28.65
     SO BUILDHGT AUXBOIL1   28.65   28.65   28.65   27.13   24.99
28.65
     SO BUILDWID AUXBOIL1   17.03   21.54   25.39   29.54   33.86
37.14
     SO BUILDWID AUXBOIL1   39.30   40.26   40.00   39.80   40.67
39.14
     SO BUILDWID AUXBOIL1   36.43   32.61   61.63   90.85   89.66
15.00
     SO BUILDWID AUXBOIL1   17.03   21.54   25.39   29.54   33.86
37.14
     SO BUILDWID AUXBOIL1   39.30   40.26   40.00   39.80   40.67
39.14
     SO BUILDWID AUXBOIL1   36.43   32.61   61.63   90.85   89.66
15.00
     SO BUILDLEN AUXBOIL1   40.96   40.67   39.14   36.43   32.61
27.99
     SO BUILDLEN AUXBOIL1   24.36   19.98   15.00   17.20   21.54
25.39
     SO BUILDLEN AUXBOIL1   29.54   33.86   58.51  132.17  130.57
40.00
     SO BUILDLEN AUXBOIL1   40.96   40.67   39.14   36.43   32.61
27.99
     SO BUILDLEN AUXBOIL1   24.36   19.98   15.00   17.20   21.54
25.39
     SO BUILDLEN AUXBOIL1   29.54   33.86   58.51  132.17  130.57
40.00
     SO XBADJ    AUXBOIL1  -47.03  -48.33  -48.16  -46.53  -43.49  -
39.12
```

```
     SO XBADJ    AUXBOIL1  -33.57  -26.99  -19.60  -55.57  -11.65   -
8.09
     SO XBADJ    AUXBOIL1   -5.36   -3.52  -22.94   39.05   32.16
4.30
     SO XBADJ    AUXBOIL1    6.08    7.67    9.02   10.11   10.88
11.13
     SO XBADJ    AUXBOIL1    9.21    7.01   44.60   38.37   -9.89  -
17.30
     SO XBADJ    AUXBOIL1  -24.19  -30.34  -35.56 -171.21 -162.73  -
44.30
     SO YBADJ    AUXBOIL1    6.34    0.88   -4.60   -9.41  -13.41  -
16.99
     SO YBADJ    AUXBOIL1  -20.06  -22.52  -24.30  -32.11  -28.00  -
28.59
     SO YBADJ    AUXBOIL1  -28.32  -27.19  -41.95   35.23   44.55  -
12.10
     SO YBADJ    AUXBOIL1   -6.34   -0.88    4.60    9.41   13.41
16.99
     SO YBADJ    AUXBOIL1   20.06   22.52   23.30   32.11   28.00
28.59
     SO YBADJ    AUXBOIL1   28.32   27.19   41.95  -35.23  -44.55
12.10
```

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

ATTACHMENT PH-76C

Meterological Data for Chula Vista, CA, San Diego Air Pollution Control District

Five electronic copies on Compact Disk (CD) have been provided to the CEC staff. Additional electronic copies on CD will be provided to others upon request.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Socioeconomics
Author: Joseph Diamond Ph. D.

BACKGROUND

Staff needs to verify that the time value of money used for all SBRP economic estimates including the IMPLAN economic impacts analysis was based on 2006 dollars.

DATA REQUEST

78. Please indicate the year for all economic estimates.

    Response: All economic estimates in Section 8.8 of the AFC are in 2006 dollars. Please also see the last sentence of the first paragraph of Section 8.8.4.3.4 of the AFC under the Phase 1 heading. This sentence should have been carried forward for all the phases discussed in Section 8.8.4.3.4 of the AFC. For the operational phase, the last sentence in the first paragraph of Section 8.8.4.4.4 of the AFC states that all costs and economic benefit estimates in the section are in 2006 dollars.

BACKGROUND

Cumulative impact analysis is part of the socioeconomic section. Staff needs to understand the potential cumulative impacts from demolition of the 69-138 kV substation.

DATA REQUEST

79. Please provide the following information related to the demolition of the existing 69-138 kV substation:

    a. Estimate beginning and ending dates of the demolition work.

    Response: It is important to note that the existing SDG&E South Bay Substation is owned and operated by SDG&E and SDG&E will be responsible for the demolition of the existing substation. However, with that as background, the demolition of the existing substation would occur after the SBRP is in commercial operations and after the functions of the existing substation are relocated to a new SDG&E substation. The SBRP is projected to begin commercial operations in the spring on 2010. Demolition of the substation could begin anytime after the SBRP is in commercial operation. While the ultimate timeframe for demolition of the existing South Bay Substation is under SDG&E's control, it is reasonable to expect that, once demolition of the substation begins, it could be completed within 6 months.

    b. Estimate monthly average and peak month's construction workforce.

    Response: As discussed in Data Response 79a above, SDG&E has control over demolition of the existing South Bay Substation. However, based on the expected activities associated with demolition of the substation, the monthly average and peak monthly construction workforce during demolition of the substation can reasonably be expected to by approximately 15 both for the average month and for the peak month.

c. Estimate percentage of the construction workforce that will be local, from San Diego County, and non-local.

Response: The approximate 15 person workforce for demolition of the SDG&E South Bay Substation is expected to be 100 percent from the local workforce in San Diego County.

BACKGROUND

There are a few economic numbers in the Socioeconomics section of the AFC which need to be clarified in order to improve staff's understanding of the project's effects.

DATA REQUEST

80. Please provide the following socioeconomic information:

d. In Socioeconomics p.8.8-28, paragraph 1, lines 1-3, please confirm that -22, or alternatively -49, is the correct induced employment number to use to yield a SAM employment multiplier of 1.9.

Response: The numbers provided on p.8.8-28 of the AFC are a combination of two sets of IMPLAN runs that were conducted for the study. In one run, the operational expenses (both labor and operations and maintenance (O&M)) of the existing SBPP were used as input into the IMPLAN model. In the second run, the operational expenses (again both labor and O&M) of the new SBRP were used as input into the IMPLAN model. The results were then compared for the two runs and the difference between the impacts was taken and reported in the AFC. The reported multiplier was based on the difference in impact values between the two plants. However, a multiplier should not have been provided or reported in this instance since the method used to derive the associated multiplier was incorrect. In fact, no multiplier should have been derived in this case.

e. Note Socioeconomics 8.8-29, paragraph 5. Please show all your assumptions and calculations used to estimate the SBRP lease payments to the San Diego Port Authority. Also include how many years for the estimated annual lease payments of $800,742.

Response: As noted in Section 8.8.4.4.5 of the AFC, the assumptions and calculations used to estimate the SBRP lease payments to the San Diego Unified Port District are as follows:

i. The number of acres that are leased, i.e., 12.9 acres
ii. An average return set by the Port – assumed to be 9.5 percent per year
iii. Charge per square foot of property of $15

Thus, based on the above assumptions, the lease payments to the Port for the SBRP site are estimated at $800,742 (12.9 acres x 43,560 feet per acre x 0.095 x $15 per square foot) per year. However, the Applicant and the Port of San Diego are finalizing negotiation of a lease option on the site. The terms of this lease option call for payments that are substantially greater than the estimated $800,742 included in the AFC. These annual lease payments are expected to last for 30 years.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Traffic and Transportation
Author: James Adams

BACKGROUND

Staff relies on information in the AFC to assess the existing traffic and transportation system near the proposed power plant site and to analyze the impacts from project construction, demolition, and operation. Two pieces of information were not provided in the Traffic and Transportation section of the AFC.

DATA REQUEST

81. Please provide an estimated percentage of current traffic flow for trucks.

Response: The annual average daily truck traffic on I-5 in the project area, from the I-5 junction with Route 75 to 8th Street, is approximately four percent. However, additional details for segments between these two locations (Main Street, Palomar Street, Bay/Industrial, J Street, H Street, etc interchanges) were not available, as the City of Chula Vista and other agencies in the area do not have and do not collect truck percentage date. The traffic analysis included as a technical appendix to the Draft Environmental Impact Report for the Chula Vista Bayfront Master Plan (over 500 pages of extensive traffic analyses) were also reviewed, but did not contain information on truck percentages.

Section 8.10.3.2 of the AFC states (pg. 8.10-10): "Turn movement and truck percentage data for intersections in Chula Vista were not available. Therefore, the traffic impacts were analyzed based on daily roadway capacity". Thus, any surface road truck percentage estimates would have to be based on I-5 data, which cannot reliably be used to estimate turn movements and truck percentage data for intersections in Chula Vista.

82. Identify any road features that may affect public safety.

Response:

The San Diego Trolley light rail railroad crossings are the only identified roadway features in the vicinity of the project that could affect public safety. The light rail railroad crossings at Palomar Street near Industrial Boulevard and L Street near Industrial Boulevard are two locations that may have an increase in traffic from project construction or operation. Both crossings are at grade and have full crossing protection (cross-guards, red-flashing signal lights, and synchronized traffic signals). Based on current trolley service a trolley crosses approximately once every five minutes. Based on the rail crossing protection at this intersection, the Applicant finds that this rail crossing does not affect public safety.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Transmission System Engineering
Authors: Laiping Ng
Technical Senior: Mark Hesters

BACKGROUND

The California Environmental Quality Act (CEQA) requires the identification and description of the direct and indirect significant effects of the project on the environment. The information requirements for the AFC require discussion of the "energy resource impacts which may result from the construction or operation of the power plant." For the identification of impacts on the transmission system resources and the indirect or downstream transmission impacts, staff relies on the System Impact and Facilities Studies as well as review of these studies by the agency responsible for insuring the interconnecting grid meets reliability standards, in this case, the California Independent System Operator (CAISO).

Without a complete System Impact or Facility study, staff is not able to fulfill the CEQA requirement to identify the indirect effects of the proposed project. These studies analyze the effect of the proposed project on the ability of the transmission network to meet reliability standards. When the studies determine that the project will cause a violation of reliability standards, the potential mitigation or upgrades required to bring the system into compliance are identified. The mitigation measures often include the construction of downstream transmission facilities. CEQA requires the analysis of any downstream facilities for potential indirect impacts of the proposed project.

Page 13 and 14 of the Interconnection Facilities Study (IFS), dated July 31, 2006, under the Power Flow Results, states that the South Bay Replacement Project (SBRP) causes overloads under Category B contingencies. The IFS also indicates that overloads appear before the addition of the SBRP and the overloads marginally increase due to the proposed SBRP. The IFS has not proposed capital improvement projects for the mitigation of the overloads.

Staff needs additional documentation and information regarding the IFS and the proposed mitigation measures in order to complete its analysis.

DATA REQUEST

83. Indicate the location and the Capacitor Bank ratings which are used to reduce the overloads of the Sycamore Canyon bank 70, 230/69 kV transformer.

    Response: All of the contingency overloads identified in the SDG&E Interconnection Facility Study (IFS) for the SBRP are only observed under the condition when the 750 MW proposed Sycamore Canyon combined-cycle power generation project is licensed and constructed. Based upon the information provided by SDG&E, the Sycamore Canyon Substation transformers might overload either with or without SBRP, however, SBRP increases loading of the transformers by about 5 percent. In case of the outage of one of the transformer banks, the parallel bank might overload as identified in the IFS. According to information provided by CAISO, the main factor causing the overload is the Sunrise Power Link, not SBRP.

Based on information provided by the SDG&E transmission department, contingency overload at Sycamore Canyon Substation bank 70, 230/69 kV transformer is sensitive to VAR flow through the transformer. As such, the status of capacitors can increase or decrease the flow through this transformer, causing it to exceed its emergency rating under contingency conditions. To mitigate this overload, several steps would to be taken with respect to VAR control:

- The tap settings on the Sycamore Canyon Substation banks would be operated at 4R or higher pre-contingency.
- The capacitors at Los Coches Substation would be turned on pre-contingency. By operating the system in this manner, the emergency rating violation of the Sycamore Canyon transformer would be mitigated.

84. If a Special Protection System (SPS) is used to mitigate the Sycamore Canyon-Miguel Tap 230 kV line overload, explain whether the SPS is existing or new for the SDG&E system. If the SPS is new, then explain who would be responsible for the capital costs.

Response: If required, the SPS required to mitigate the observed overloads on the Sycamore Canyon – Miguel tap 230 kV would be a new SPS. The cost of this SPS would most likely be borne by the Applicant. As SPS is generally qualified as a network/reliability upgrade, the cost of this installation would most likely be refunded to the Applicant in accordance with FERC rules on this issue.

85. The Eastgate-Rose Canyon 69 kV line is overloaded by 2.1% under Category B contingency. On page 14, the IFS states: "The dispatch in this case is not typical of how the system would be operated…" and "This line is only rated at 50.3 MVA and will likely be a future grid assessment project". Please explain how the system would be operated in order to avoid the overload. Provide detailed information on how the line would be upgraded, the schedule of the upgrades, and who would be responsible for the capital costs.

Response: Based upon information provided by SDG&E planning department, to mitigate this overload, one GT at the Kearny Substation would be dispatched pre-contingency. This reduces the post contingency loading below the emergency rating. There are no plans to upgrade this line at this time, as long as the overload can be mitigated by dispatching Kearny GTs. At such time as the overload becomes large enough, or the dispatch uneconomical enough, SDG&E will propose a project to reconductor this line as part of its yearly grid assessment. In this case, the capital cost is expected to be borne by SDG&E.

86. The Sycamore Canyon-Carlton Hills Tap 138 kV line exceeds its emergency rating by 8.9%. Please explain the mitigation proposed for the overload and identify the parties who would be responsible for the upgrades.

Response: This overload is being addressed as part of the 2006 Grid Assessment. The solution to this overload is to reconfigure TL 13821, which includes Sycamore Canyon – Carlton Hills Tap. The tap will be moved close to Mission Substation, and the line will become Sycamore Canyon – Mission – Carlton Hills three terminal line. Presently, the line is Sycamore Canyon – Carlton Hills – Santee three terminal line. The change in

configuration will increase the impedance between Sycamore Canyon and the load busses at Santee and Los Coches Substations significantly. This increase in impedance will reduce the flows on this segment of line below its emergency rating post-contingency.

87. The Thermal Analysis: MVA2 Excel table (no page number) listed eight alternatives and pre and post project impacts for each alternative. Alternative 8 seemed to be the worse case scenario. Please clarify which alternative would be the relevant scenario for the determination of overloads and identification of mitigation. If the overloads will be addressed by other studies or will be mitigated by the SBRP, please be specific on how and when an upgrade, if any, will take place.

Response: The relevant alternatives in this study are Alternatives 6 & 7 with high-import, lower generation scenarios. Case 8 is a sensitivity case in which all Qualifying Facilities (QFs) are not dispatched. This amounts to a G-17 scenario, which is outside the scope of planning studies. This scenario would not take place under a heavy summer condition, which was studied for the SDG&E Interconnection Facility Study. This case was established to examine the effects on the SDG&E system if all QFs were offline, in order to identify potential issues that may arise if these facilities shut down and are unavailable to dispatch. Until these plants are retired, they are assumed to be online and dispatched due to what is essentially a must-take status.

During heavy summer conditions, all QFs that can dispatch are assumed to operate at full output. Under no heavy summer circumstances would ALL QFs in the SDG&E system remain offline. Therefore, the overloads identified in Case 8 are advisory only, and not meant to represent facilities that would need upgrades as a result of the SBRP.

88. The IFS states that the Category C contingency study was performed. The Category C contingency was listed in the other "Thermal Analysis: MVA2" table (no page number). Please provide mitigation proposed for the overloads identified under Category C contingencies and identify the parties who would be responsible.

Response: The overloads identified in the category C analysis are the following:

A. Sycamore Canyon – Carlton Hills Tap 138 kV
B. Eastgate – Rose Canyon 69 kV
C. Miguel – Jamacha 69 kV #2

According to the information provided by the SDG&E planning department:

1. Sycamore Canyon – Carlton Hills Tap: This overload will be mitigated as part of the rearrangement described in response to Data Response 85.

2. Eastgate – Rose Canyon: this overload will be mitigated by dispatching one of the Kearny GTs as described in Data Response 84.

3. Miguel – Jamacha: This case (Case 8) is a sensitivity case and is advisory only. There are several QFs in the local 69 kV system which are offline in this case, increasing the flow on this line. In a real time heavy summer scenario, these QFs will be dispatched, mitigating this overload. Please see response to Data Response 86.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Waste Management
Author: Michael Stephens

BACKGROUND

Phase I and Phase II environmental investigations were conducted at the existing South Bay Power Plant facility South Bay Power Plant site in 1998. An additional Phase I investigation was conducted in 2005 that included both the LNG and the South Bay Power Plant facilities. The investigations identified significant environmental issues including soil and groundwater contamination at the South Bay Power Plant, with additional investigation work recommended for the LNG site. A Workplan was completed in June 2005 in response to a request by DTSC to further characterize the South Bay Power Plant. The Workplan presents proposed soil and groundwater investigation and remediation activities at the existing plant site; as well as a summary of contamination assessment data that had been previously obtained at the site. It is uncertain what, if any, additional investigation and remediation activities have actually been conducted since the Workplan was prepared. The Workplan identifies numerous Solid Waste Management Units and Areas of Concern at the existing facility, which may also be found at the South Bay Replacement Project site. The main concerns appear to be petroleum hydrocarbons and metals in soils, and petroleum hydrocarbons and low level Volatile Organic Compounds (VOC's) in groundwater. Risk(s) to human health and the environment have not been quantified.

The AFC states that DTSC is the lead agency conducting oversight of investigation and remediation activities for the existing facility. Agencies normally enter into an oversight agreement with parties responsible for investigation and cleanup activities in a particular area. No oversight agreement between the applicant and DTSC was presented in the AFC.

DATA REQUEST

89. A comprehensive human health risk assessment should be conducted that includes possible exposure pathways to construction workers, facility personnel, and the public. Please provide a human health risk assessment for the South Bay Replacement Project (SBRP) site.

    Response: As discussed in Section 8.13.2.1.1 (p. 8.13-6) of the AFC, investigations of the former LNG site, the location of the SBRP, have been undertaken to determine whether or not contamination is present that could warrant removal or remediation. These investigations include a 2001 Phase II Environmental Assessment, which included soil and ground water sampling and analysis) and a 2005 Phase I Environmental Site Assessments (both or which are included in the CEC's proceedings for the SBRP project). Based on the results of the 2001 and 2005 assessments of the LNG site,, there is no evidence of soil and/or groundwater contamination at the former LNG site. The 2001 Phase II Environmental Assessment recommended that an environmental professional be present during excavation and grading activities associated with the construction of the SBRP to inspect for the presence of any previously unidentified and/or undisclosed environmental conditions. This recommendation is typical for a site for which a Phase II

Environmental Assessment finds no evidence of soil and/or groundwater contamination.

There is no data available that the Applicant is aware of that supports CEC staff's contention in the background section for these Waste Management data requests that contamination found at the existing South Bay Power Plant site may also be found on the SBRP project site (the former LNG site). Rather, the investigations conducted to date have documented a significant difference between the conditions at the existing South Bay Power Plant, which is the subject of ongoing investigations by SDG&E under the oversight of DTSC, and the former LNG site.

The findings of the 2001 Phase II Environmental Assessment and the 2005 Phase I Environmental Site Assessment for the former LNG site do not support the request by CEC staff in this data request that a human health risk assessment should be conducted for the SBRP site, as the data does not show evidence of soil and/or groundwater contamination. As the data shows no contamination to remediate at the LNG site, if a human health risk assessment was conducted, it would be based on the finding of no contamination and the analysis would show no human health risk.

90. An ecological risk assessment should be conducted that includes an assessment of the potential risk to aquatic life in the bay. Please provide an ecological risk assessment for the SBRP site.

Response: As discussed in Section 8.13.2.1.1 (p. 8.13-6) of the AFC, investigations of the former LNG site, the location of the SBRP, have been undertaken to determine whether or not contamination is present that could warrant removal or remediation. These investigations include a 2001 Phase II Environmental Assessment, which included soil and ground water sampling and analysis) and a 2005 Phase I Environmental Site Assessments (both or which are included in the CEC's proceedings for the SBRP project). Based on the results of the 2001 and 2005 assessments of the LNG site, there is no evidence of soil and/or groundwater contamination at the former LNG site. The 2001 Phase II Environmental Assessment recommended that an environmental professional be present during excavation and grading activities associated with the construction of the SBRP to inspect for the presence of any previously unidentified and/or undisclosed environmental conditions. This recommendation is typical for a site for which a Phase II Environmental Assessment finds no evidence of soil and/or groundwater contamination.

There is no data available that the Applicant is aware of that supports CEC staff's contention in the background section for these Waste Management data requests that contamination found at the existing South Bay Power Plant site may also be found on the SBRP project site (the former LNG site). Rather, the investigations conducted to date have documented a significant difference between the conditions at the existing South Bay Power Plant, which is the subject of ongoing investigations by SDG&E under the oversight of DTSC, and the former LNG site.

The findings of the 2001 Phase II Environmental Assessment and the 2005 Phase I Environmental Site Assessment for the former LNG site do not support the request by CEC staff in this data request that an ecological risk assessment should be conducted for the SBRP site, as the data does not show evidence of soil and/or groundwater

contamination. As the data shows no contamination to remediate at the LNG site, if an ecological risk assessment was conducted, it would be based on the finding of no contamination and the analysis would show no ecological risk.

91. Please provide information on investigation and remediation activities that have occurred since the 2005 Workplan was presented to DTSC; as well as those activities that are planned. Please discuss the Workplan's applicability to the SBRP site, if any. If the 2005 Workplan is not applicable to the SBRP Site, please provide a Workplan Addendum, or a separate workplan, identifying proposed activities. Please provide a schedule for these planned activities; if any.

Response: The 2005 Workplan referenced in this data request was prepared and submitted to DTSC by SDG&E and is solely for the existing South Bay Power Plant site and, as such, is not applicable to the SBRP site. The Applicant is not directly involved in SDG&E's investigation of the existing South Bay Power Plant; therefore, the Applicant is not in the position to provide information of the investigation or remedial activities that SDG&E may have implemented or that may be planned at the existing South Bay Power Plant under the oversight of DTSC.

As discussed above in data responses to Data Requests 89 and 90 above, based on the 2001 Phase II Environmental Assessment and 2005 Phase I Environmental Site Assessment for the LNG site (the location of the SBRP), there is no evidence of soil and/or groundwater contamination at the former LNG site. The 2001 Phase II Environmental Assessment recommend that an environmental professional be present during excavation and grading activities associated with the construction of the SBRP to inspect for the presence of any previously unidentified and/or undisclosed environmental conditions. This recommendation is typical for a site for which a Phase II Environmental Assessment finds no evidence of soil and/or groundwater contamination.

There is no data available that the Applicant is aware of that supports CEC staff's contention in the background section for these Waste Management data requests that contamination found at the existing South Bay Power Plant site may also be found on the SBRP project site (the former LNG site). Rather, the investigations conducted to date have documented a significant difference between the conditions at the existing South Bay Power Plant, which is the subject of ongoing investigations by SDG&E under the oversight of DTSC, and the former LNG site.

The findings of the 2001 Phase II Environmental Assessment, and the 2005 Phase I Environmental Site Assessments for the former LNG site do not support the request by CEC staff in this data request that a workplan be prepared for additional investigations at the LNG site as part of the of the SBRP project.

92. Please provide a copy of a signed oversight agreement with DTSC for investigation and cleanup of the Site.

Response: The LNG site is not under the oversight of DTSC or the California Regional Water Quality Control Board – San Diego Region as there is no evidence of soil or ground water contamination at the LNG site.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Worker Safety/Fire Prevention
Author: Alvin Greenberg

BACKGROUND

Section 2.3.9.4 of the AFC describes the fire prevention, suppression, and response systems for the proposed power plant during the Operational Phase. These include fixed water and CO_2 systems as well as portable systems. Section 8.7.3.4 describes the off-site fire response available and section 8.7 includes a brief discussion of the fire training programs. However, the AFC does not describe the fire prevention, suppression, and response systems that would be on-site during the Construction Phase and during the Demolition Phase.

Staff needs more specific information on the fire prevention and response plans, including HazMat spill response and Emergency Medical Services (EMS) response during the Construction and Demolition Phases.

DATA REQUESTS

93. Please provide specific information on the fire prevention and response methods planned for the Construction Phase and for the Demolition Phase.

Response: A Fire Protection and Prevention Program will be in place at the project site during both demolition and construction phases as identified in Table 8.7-5 of the AFC. Construction and demolition of the SBRP will be conducted in accordance with Article 80 of the Uniform Fire Code, NFPA 10, Title 29 CFR 1926, and 8 CCR 1920, and will be subject to a cooperation agreement with the Chula Vista Fire Department.

For small localized fires that can be extinguished by one or two onsite workers, fire extinguishers will be located such that the travel distance from any work area to the nearest extinguisher is less than 100 feet. When 5 gallons or more of a flammable or combustible liquid is being used, an extinguisher will be located within 50 feet. The extinguishers will:

- Be maintained in a fully charged and operable condition.
- Be visually inspected each month.
- Undergo a maintenance check each year.

During demolition, the greatest fire hazard is anticipated to be cutting and welding activities. During cutting and welding operations objects to be welded or cut will be moved to a safe location (when practicable). If not possible, all movable combustibles will be relocated at least 35 feet from the work site. In addition fire-extinguishing equipment shall be immediately available in the work area. When welding or cutting operations are such that normal fire-prevention precautions are not sufficient, additional trained personnel will be assigned to guard against fire while the actual welding or cutting operation is being performed and for a sufficient period of time after completion of the work to ensure that no possibility of fire exists.

In the event of a larger fire, the City of Chula Vista Fire Department will be contacted. The nearest fire station is located approximately 1.25 miles to the east of the project site. During a large fire event, construction and demolition employees would evacuate to a

designated location at the project site and await further instruction. The response time to an emergency at the project site is approximately 6 minutes.

94. Please provide a brief summary of the planned EMS and HazMat spill response capability for the Construction and Demolition Phases.

Response: As described in Section 8.12.8.1 of the AFC, small spills will be contained and cleaned up immediately by trained, onsite personnel. Larger spills will be reported via emergency phone numbers to obtain help from offsite containment and cleanup crews.

Small spills (those that require approximately 10 minutes to clean up) will likely be composed of petroleum products (oil and/or fuel), and in the event of a spill to soil, the soil will be excavated and disposed of in containers for offsite disposal. Empty drums, shovels, and spill cleanup items (absorbent pads and oil absorbent) will be stored onsite and located adjacent to potential spill sources such as the refueling area and the hazardous materials storage area.

In the event of a larger spill, the spill will be contained using absorbent pigs, "kitty litter" absorbent, and absorbent pads. Offsite containment and cleanup crews will be contacted to provide spill clean-up support.

A site safety coordinator will be onsite during demolition and construction. The coordinator will have basic first aid skills, however in the event of an emergency, Emergency Medical Services (EMS) support will be provided by the City of Chula Vista fire department. The response time to an emergency at the project site is approximately 6 minutes.

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Visual Resources
Author: David Flores

BACKGROUND

Staff relies on information in the Application for Certification (AFC) to assess the existing visual setting near the proposed power plant site. The following information is necessary for staff to evaluate the proposed project's impact on the area viewshed.

DATA REQUEST

95. Please provide information on the frequency, size and time of the year when visible plumes have typically been observed from the existing South Bay power plant. Preferably, this information should be obtained from public officials (i.e. port officials) who work in the nearby area.

Response: There are no official records of plume visibility from the existing South Bay Power Plant. Due to the lack of available information, Section 8.11.2.10 of the AFC analysis provided information collected from SBPP employees who have had the opportunity to observe the plume on a daily basis as well as scientific data regarding the meteorological conditions which typically result in a visual plume. In response to Data Request 95, the Applicant has contacted both the San Diego Air Pollution Control District (SDAPCD) as well as the San Diego Unified Port District (Port) to obtain additional information. These public agencies did not have information about the plume visibility on a daily basis, but they provided information about complaints received regarding the plume.

The SDAPCD has received one complaint related to the SBPP plume. However, they discovered that the plume in question was natural pollen in the air rather than a visual plume from the SBPP. This information was provided through a personal communication between Camqui Nguyen of SDAPCD and Eric Walther of Sierra Research on November 3, 2006.

The Port does not monitor visible plumes from the existing South Bay Power Plant and does not have any information such as that requested by the CEC staff in this data request. The Port has no record of complaints having been received by the Port related to a visible plum. This information was provided in a letter from Randa Coniglio of the Port dated November 28, 2006 and is provided as Attachment VIS-95.

Unified Port
of San Diego

3165 Pacific Highway, San Diego, CA 92101
P.O. Box 120488, San Diego, CA 92112-0488
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ATTACHMENT VIS-95

November 28, 2006

LS POWER GENERATION, LLC
1735 Technology Drive, Suite 820
San Jose, CA 95110-1384

Attention: Kevin R. Johnson, Vice President

Re: South Bay Replacement Project - CEC Staff Visual Resources Data Request
Visible Plume from Existing South Bay Power Plant

Dear Mr. Johnson:

I am writing pursuant to your request, to formally address the CEC's Data Request No. 95 requesting information from Port Officials regarding the frequency, size and time of year when visible plumes have typically been observed from the South Bay Power Plant.

The Port does not monitor visible plumes from the South Bay Power Plant and does not have any information such as that requested by the CEC. There is no record of a complaint having been received by the Port District related to a visible plume.

Sincerely,

Randa J. Coniglio
Area Real Estate Manager

RJC/tj

Document #209224

SOUTH BAY REPLACEMENT PROJECT (06-AFC-3)
DATA RESPONSES, SET 1A

Technical Area: Soil and Water Resources
Author: Richard Latteri

BACKGROUND

State Water Code Section 13551 finds the use of potable water for industrial and irrigation uses is a waste or an unreasonable use of potable water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available. Conservation of raw and potable water is encouraged in the San Diego Bay area as 90 percent of the region's water is imported from the Colorado River.

The SBRP proposes to use potable water for all construction, operation and demolition activities as outlined in Table 8.14-2 of the AFC. Sweetwater Authority, via a "Will-Serve" letter dated April 19, 2006, has committed to supplying up to 1,200 gallons per minute (maximum annual usage of 129 AFY) for all construction/demolition and operation activities of the SBRP. Additional information on the estimated amount of potable water consumption and its availability is required for staff to conduct a complete analysis of potential impacts to water resources.

DATA REQUEST

96. Please provide an itemized estimate in tabular format of total water consumption for plant and switchyard construction, equipment wash water, hydrostatic testing of all pipelines, SBRP operation, landscape irrigation, and demolition of the SBPP and switchyard. Please provide the estimate in gallons and gallons per day and/or acre-feet per year.

Response: Table S&W-96 supplements the information provided in Table 8.14-2 of the AFC. Table S&W-96 provides the water needs for demolition, construction, operations, and landscape irrigation related to the SBRP, which also includes the demolition of the existing SBPP and existing SDG&E South Bay Substation.

TABLE S&W-96
Average Water Usage [a] from the Sweetwater Authority in Gallons per Minute (GPM) and Gallons per Day (GPD)

	LNG Demo/Site Prep Phase	Construction Phase	SBPP Demo Phase	Relocated Substation Construction Phase	Post-relocated Substation Construction Phase
	GPM / GPD	GPM / GPD	GPM / GPD	GPM / GPD	GPM / GPD
LNG Demo/SBRP Site Prep	433 / 260,000	—	—	—	—
SBRP Construction[b]	—	217 / 130,200	—	—	—
SBRP Operation[c]	—	—	50[b] / 30,000	50[b] / 30,000	50[b] / 30,000
Landscape Irrigation[d]	—	—	30 / 18,000	30 / 18,000	30 / 18,000
SBPP Demo	—	—	190 / 114,000	—	—
SBPP Switchyard Demo	—	—	20 / 12,000	—	—

TABLE S&W-96
Average Water Usage [a] from the Sweetwater Authority in Gallons per Minute (GPM) and Gallons per Day (GPD)

	LNG Demo/Site Prep Phase	Construction Phase	SBPP Demo Phase	Relocated Substation Construction Phase	Post-relocated Substation Construction Phase
SDG&E Substation Construction	—	—	—	88 / 52,950	—
TOTAL	433 / 260,000	217 / 130,200	290 / 274,000	168 / 100,950	80[b] / 48,000

[a] Estimations assume a 10-hour work day

[b] Includes construction washdown and hydrostatic testing

[c] Baseload generation (without duct firing), full load generation (with duct firing) is 80 gpm

[d] Estimation assumes an 8-hour day

97. Please provide the rationale and economic justification for not using tertiary treated recycled water for those activities (construction/demolition dust control and soil compaction, hydrostatic testing, landscape irrigation, and steam supply/equipment wash water).

Response: The nearest source of tertiary treated recycled water to the SBRP site is the South Bay Water Reclamation Plant located approximately 5 miles south of the site. At this time, there are no public agency plans to construct a recycled water pipeline to the vicinity of the SBRP site. Therefore, to provide recycled water for the construction of SBRP, and demolition of the existing SBPP and existing SDG&E South Bay Substation would require either the construction of an approximately 5-mile pipeline at an estimated cost of $8 million. This capital cost of $8 million would be borne by the SBRP. In addition, there would be an additional capacity charge of approximately $590,000 borne by the SBRP. The other option would be to truck the recycled water from the South Bay Water Reclamation Plant to the SBRP site with the associated increased in truck traffic and associated air emissions. It should also be noted, that the pipeline routing would need to cross sensitive biological areas, included wetlands, such as the Tia Juana River estuary.

Similarly, for normal plant operation to use tertiary treated recycled water, the above-referenced pipeline would also be required at an estimated cost of $8 million to the Project along with the $590,000 capacity charge.

In addition to the above capital cost directly associated with construction of an approximate 5-mile pipeline, the use of tertiary treated recycled water for operation of the SBRP would require additional pretreatment. Micro-filtration is an appropriate pretreatment for the reverse osmosis system necessary for steam-cycle water. The addition of micro-filtration will require additional equipment, produce additional wastewater and require additional building space and operating costs. Additional operating costs would consist of chemicals and energy for pumping

through the additional equipment. Estimates for addition of the equipment and for the differential operating costs are as follows:

Capital Costs:

Equipment: $250,000

Building: $120,000

Installation: $250,000

Differential Operating Costs ($/year):

Additional water: $ 3,200

Pumping power: $3,300

Polymer: $ 400

The additional capital, and operations and maintenance costs to the Project of providing the infrastructure to supply recycled water to the SBRP site for construction and demolition, and 30 to 35 years of operation of the SBRP are not justified on an economic basis as it is cost-prohibitive.

SBRP eliminates the use of seawater for once-through-cooling that is used for the existing SBPP, and just as importantly the SBRP has incorporated air cooled condensers rather than wet cooling tower. These two Project factors have major positive implications for water resources and water usage. The volume of potable water required for SBRP for operations (55 acre-feet/year at maximum output) is a fraction of the potable water used by the existing SBPP (224 acre-feet/year historic use), or that would be used if SBRP included wet cooling towers (175 acre-feet/year at maximum output). Therefore, SBRP is consistent with the CEC's Integrated Energy Policy Report, Section 5 – Power Plant Water Use and Waste Water Discharge which encourages the use of air cooled technologies.

Another option would be to truck-haul tertiary-treated recycled water to the SBRP to support project related demolition, construction and operations. However, as noted above, the water for operations would still require additional pretreatment. In addition, truck-hauling recycled water from the South Bay WRP to the SBRP site for project related demolition, construction and operations would result in traffic and air impacts.

Based on the volumes of water required for SBRP related demolition, construction and operations (see Table S&W-96), and assuming each truck trip delivers 20,000 gallons of water, the following number of additional truck round-trips per day (5 days per week for demolition and construction 7 days per week for operations) will be required for the following phases of the SBRP:

- LNG Site Demolition/Site Preparation 13
- SBRP Construction 7
- SBPP Demolition (includes operations of SBRP) 6
- SBRP Operations (includes landscape irrigation) 3

Using heavy-duty, highway truck emissions factors published by the California Air Resources Control Board (ARB), these additional daily round-trip truck trips associated with the use of recycled water rather than potable water for demolition, construction and operation would result in the following additional air emissions by Project phase (NO_x and PM_{10} as representative emissions):

- LNG Demolition: As discussed in Section 2.5.4 of the AFC, demolition of the remaining LNG tank foundation and associated concrete foundation is expected to take 3 months. As discussed in Section 2.5.4 of the AFC, this demolition will occur as part of site preparation for construction of the SBRP. Based on 13 water tank truck round-trips per day, the use of recycled water rather than potable water for demolition/construction would result in the following additional NO_x and PM_{10} emissions during the 3 months of LNG demolition:

  - NO_x: 124.6 lbs (3 month total)
  - PM_{10}: 28.0 lbs (3 month total)

- SBRP Construction: As discussed in Section 2.3.16.1 of the AFC (and shown in Figure 1.6-1 of the AFC), construction of the SBRP is expected to take 28 months. Based on 7 water tank truck round-trips per day, the use of recycled water rather than potable water for construction would result in the following additional NO_x and PM_{10} emissions (annual/total during construction):

  - NO_x: 499 lbs/year or 1,123 lbs/total construction period
  - PM_{10}: 10.4 lbs/year or 23.4 lbs/total construction period

- SBPP Demolition: As discussed in Section 2.5.4 of the AFC, demolition of the existing SBPP is expected to take 25 months. Based on 6 water tank truck round-trips per day, the use of recycled water rather than potable water for demolition of SBPP would result in the following additional NO_x and PM_{10} emissions (annual/total during demolition):

  - NO_x: 426 lbs/year or 887 lbs/total demolition period
  - PM_{10}: 10.4 lbs/year or 21.7 lbs/total demolition period

- SBRP Operations (including landscape irrigation): As discussed in the AFC, SBRP is expected to operate a minimum of 30 years. Based on 3 water tank truck round-trips per day (365 days per year for 30 years) the use of recycled water rather than potable water for operation would result in the following additional NO_x and PM_{10} emissions (annual/total operations):

  - NO_x: 299 lbs/year or 8,970 lbs/total operations
  - PM_{10}: 6.9 lbs/year or 2,070 lbs/total operations

- Combined SBRP Operations and SBPP Demolition: As discussed in Section 2.5.4 of the AFC. During the first two years of operations of SBRP, the existing SBPP will be demolished, resulting in a combined use of water for operations and demolition. Based on a combined total of 9 water tank truck round-trips per day,

the use of recycled water rather than potable water would result in the following additional NO_x and PM_{10} emissions (annual/total for 2 years):

- NO_x: 725 lbs/year or 9,847 lbs/2 years total
- PM_{10}: 17.3 lbs year or 2,091 lbs/2 year total

Based on the additional air emissions associated with the truck haul of recycled water as compared to the use of potable water for construction, demolition and operations, the Applicant finds that the truck haul of recycled water is not justified.

As discussed above: 1) the elimination of the use of seawater for once-through-cooling and incorporation of air-cooled condensers rather than wet cooling towers for the SBRP; 2) the avoidance of impacts associated with the construction of a 5-mile recycled water pipeline; and 3) the avoidance of additional truck trips and associated additional air emissions if recycled water was trucked to the site; are all important factors in the Applicant's decision to use potable water for SBRP rather than recycled water.

98. Please provide an economic analysis comparing the use of potable water versus tertiary treated recycled water over a 35 year period that encompasses both the construction/demolition and operation phases of the SBRP. In the analysis, please use tertiary treated recycled water supplied from the South Bay Water Reclamation Plant's distribution system for all purposes except drinking/sanitation water, potable waterline hydrostatic testing and fire suppression.

Response: Please see Data Response 97 above.

BACKGROUND

The SBRP will be required to complete and implement a Storm Water Pollution Prevention Plan (SWPPP) that complies with SWRCB Order No. 99-08-DWQ for discharges associated with construction activities as well as a Standard Urban Stormwater Mitigation Plan that complies with both the San Diego Regional Water Quality Control Board (SDRWQCB) Order No. 2001-01 and Article 10 of the San Diego Unified Port District Code. Additionally, the Energy Commission will require a Drainage Erosion and Sediment Control Plan (DESCP).

99. The DESCP is to be a separate document which will be updated and revised as the project moves from the preliminary to final design phases. While Appendix 8.14A of the AFC contains several erosion/sediment control Best Management Practices (BMPs) and water pollution control drawings, these will need to be aggregated into a draft DESCP.

Response: A draft DESCP has been prepared and is provided as Attachment S&W-99.

DATA REQUEST

100. Please provide a draft DESCP containing elements A through I below outlining site management activities and erosion/sediment control BMPs to be implemented during site mobilization, excavation/demolition, construction, and post-construction activities. Within the draft DESCP, please provide a

discussion of those additional requirements of SDRWQCB Order No. 2001-01 and Article 10 of the San Diego Unified Port District Code for the handling and disposal of demolition/contaminated materials as they relate to soils and erosion control. The level of detail in the draft DESCP shall be commensurate with the current level of planning for site demolition and corresponding site grading and drainage. The DESCP submitted prior to site mobilization must be designed and sealed by a professional engineer/erosion control specialist. Please provide all conceptual erosion control information for those phases of construction and post-construction that have been developed or provide a statement when such information will be available.

A. **Vicinity Map** – A map(s) at a minimum scale 1"=100' will be provided indicating the location of all project elements with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

Response: A vicinity map has been included with the DESCP (Attachment S&W-99), however, it is at a smaller scale than 1″ = 100′ to properly show geographic location of the project. Drawings for the below sections (grading plans, drainage maps, site delineation, etc.) are shown at a scale of 1″ = 100′ or larger.

B. **Site Delineation** – All areas subject to soil disturbance for the SBRP (project site, lay down/demolition areas, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing boundary lines of all construction/demolition areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

Response: Site delineation is provided in Attachment S&W-99.

C. **Watercourses and Critical Areas** – The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. Indicate the proximity of those features to the SBRP construction, lay down/demolition, and landscape areas and all transmission and pipeline construction corridors.

Response: Watercourses and critical areas are identified in Attachment S&W-99.

D. **Drainage Map** – The DESCP shall provide a topographic site map(s) at a minimum scale 1"=100' showing all existing, interim and proposed drainage systems and drainage area boundaries. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours shall be extended off-site for a minimum distance of 100 feet in flat terrain.

Response: A drainage map is provided in Attachment S&W-99.

E. **Drainage of Project Site Narrative** – The DESCP shall include a narrative of the drainage measures to be taken to protect the site and downstream facilities. The narrative should include the summary pages from the hydraulic analysis prepared by a professional engineer/erosion control specialist. The narrative shall state the watershed size(s) in acres that was used in the

calculation of drainage measures. The hydraulic analysis should be used to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the SBRP construction and laydown/demolition areas.

Response: The Drainage of Project Site Narrative is provided as Attachment S&W-99.

F. **Clearing and Grading Plans** – The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography.

Response: Clearing and grading plans are provided in Attachment S&W-99.

G. **Clearing and Grading Narrative** – The DESCP shall include a table with the quantities of material excavated or filled for the site and all project elements of the SBRP (project site, lay down/demolition areas, transmission corridors, and pipeline corridors) to include those materials removed from the site due to demolition, whether such excavations or fill is temporary or permanent, and the amount of such material to be imported or exported. The table shall distinguish whether such excavations or fill is temporary or permanent and the amount of material to be imported or exported.

Response: The Clearing and Grading Narrative is provided in Attachment S&W-99.

H. **Best Management Practices Plan** – The DESCP shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction (initial grading/demolition, project element excavation and construction, and final grading/stabilization). BMPs shall include measures designed to prevent wind and water erosion in areas with existing soil contamination. Treatment control BMPs used during construction should enable testing of groundwater and/or stormwater runoff prior to discharge to San Diego Bay.

Response: The Best Management Practices Plan is provided in Attachment S&W-99.

I. **Best Management Practices Narrative** – The DESCP shall show the location (as identified in H above), timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading/demolition, during project element excavation and construction, final grading/stabilization, and post-construction. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule should include post-construction maintenance of structural control BMPs, or a statement provided when such information will be available

Response: The Best Management Practices Narrative is provided as Attachment S&W-99.

LS Power

South Bay Energy Facility

Drainage Erosion and Sediment Control Plan

DRAFT

B&V Project No. 136469

November 2006

BLACK & VEATCH
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ENERGY WATER INFORMATION GOVERNMENT

1.0 Introduction

This plan consists of the following sections and attachments:

- Section 1.0--Introduction.
- Section 2.0--Vicinity Map.
- Section 3.0--Site Delineation.
- Section 4.0--Watercourses and Critical Areas.
- Section 5.0--Drainage Map.
- Section 6.0--Drainage of Project Site Narrative.
- Section 7.0--Clearing and Grading Plans.
- Section 8.0--Clearing and Grading Narrative.
- Section 9.0--Best Management Practices Plan.
- Section 10.0--Best Management Practices Narrative.
- Attachment A--Project Drawings.
- Attachment B--BMP Data Sheets
- Attachment C--Hydraulic Analysis

1.1 San Diego RWQCB Order No. 2001-01

Pursuant to the Clean Water Act, a Municipal Stormwater NPDES Permit (Order No. 2001-01, NPDES No. CAS0108758) was issued to San Diego County, the Port, and 18 cities (including Chula Vista) by the San Diego Regional Water Quality Control Board (RWQCB) on February 21, 2001. This Municipal Permit was issued pursuant to the US Environmental Protection Agency's Phase I Municipal Program and requires the development and implementation of a program addressing stormwater runoff pollution issues in development planning for public and private projects. The South Bay Replacement Project (SBRP) will implement BMPs to reduce pollutants to the maximum extent practicable during construction (including demolition) and operations, as described in this DESCP.

1.2 San Diego Unified Port District

Article 10 of the San Diego Unified Port District Code (Ordinance 2105, Stormwater Management and Discharge Control) sets forth uniform requirements and prohibitions for stormwater discharges. This ordinance addresses stormwater pollution prevention, pollutant source controls and treatment controls, runoff diversion, and the regulation of discharges to the Port-controlled storm drain system and/or the Bay. It was developed to reduce pollution from stormwater discharges and to protect public health, natural resources, and the environment. This applies to all dischargers and places located on tidelands within the Port's jurisdiction that discharge stormwater or non-stormwater into any stormwater system or receiving waters.

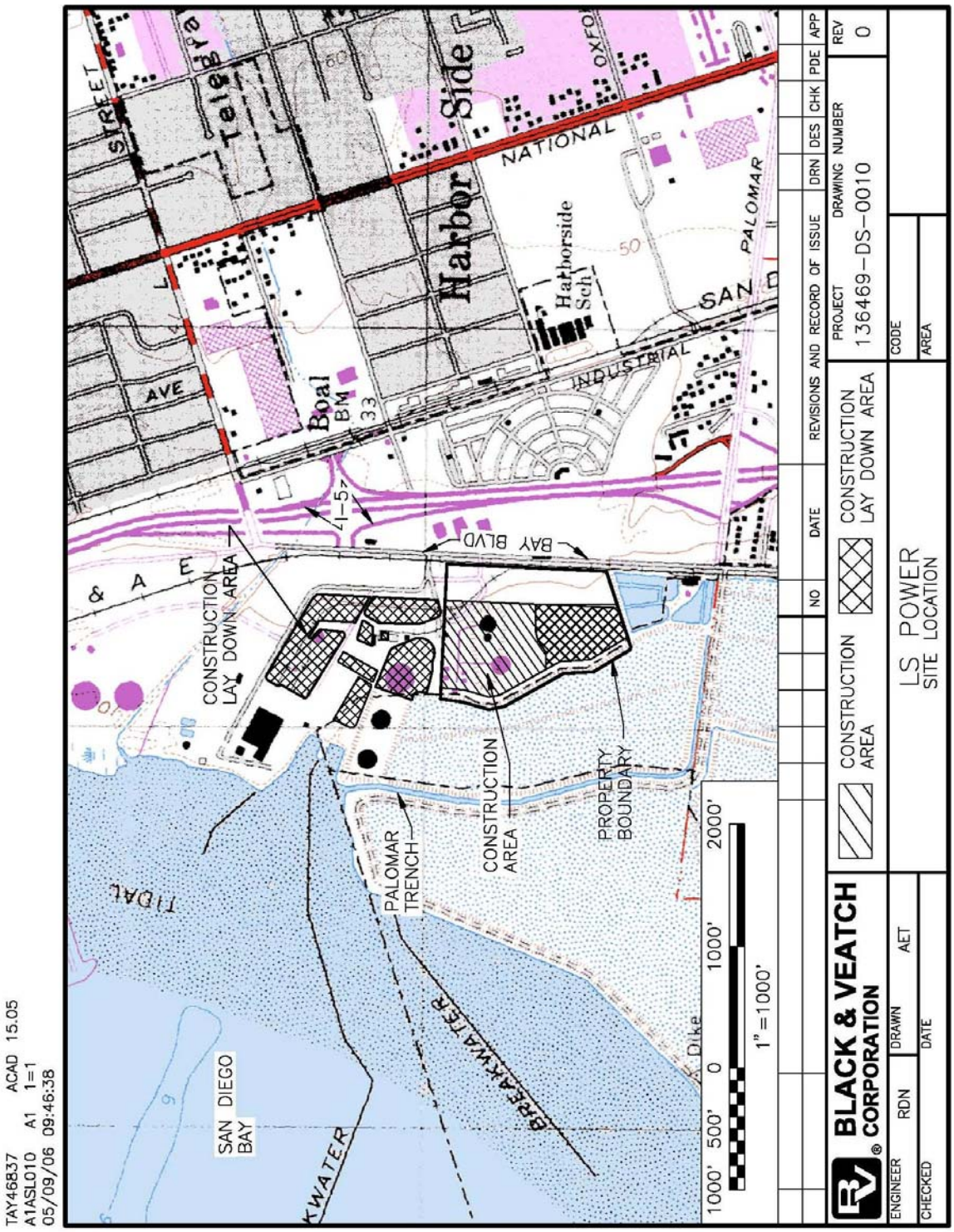
The Port has developed a model Standard Urban Storm Water Mitigation Plan (SUSMP) to reduce pollutants and runoff flows from all new development and significant redevelopment projects falling under the priority project categories. The SBRP and

demolition of the existing SBPP fall into the category of “redevelopment” and will follow the guidelines outlined in the SUSMP. Guidelines of the SUSMP include steps to identify and mitigate pollutants and conditions of concern. Compliance with the SUSMP will compliment the requirement to prepare and implement a SWPPP for industrial activities.

Ordinance 2105 also requires any person performing construction work on district tidelands to, the maximum extent practicable, prevent pollutants from entering the stormwater system. In accordance with Ordinance 2105, the Applicant will include stormwater best management practices during project construction, demolition, and in the design of the SBRP, as described in this DESCP.

2.0 Vicinity Map

The construction project vicinity map showing the project location is shown on the following page.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CONSTRUCTION LAY DOWN AREA
CONSTRUCTION AREA
PROPERTY BOUNDARY
PALOMAR TRENCH
SAN DIEGO BAY
TIDAL
BREAKWATER
BAY BLVD
INDUSTRIAL
NATIONAL
PALOMAR
Harbor Side
Harborside Sch
Boal BM 33
AVE
STREET
1" = 1000'
1000' 500' 0 1000' 2000'
NO DATE REVISIONS AND RECORD OF ISSUE DRN DES CHK PDE APP
CONSTRUCTION AREA
CONSTRUCTION LAY DOWN AREA
LS POWER
SITE LOCATION
BLACK & VEATCH CORPORATION
ENGINEER RDN DRAWN AET
CHECKED DATE
PROJECT 136469
DRAWING NUMBER DS-0010
REV 0
CODE
AREA

3.0 Site Delineation

See Attachment A for drawing 136469-DS-3801 for the Site Construction Facilities Plan.

4.0 Watercourses and Critical Areas

See Attachment A for Figures 8.14.1 for a depiction of regional surface waters near the site. See drawings listed in Sections 5.0 and 7.0 below for site specific existing and proposed drainage schemes.

5.0 Drainage Map

See Attachment A for drawing 136469-SS-0001 for the Preconstruction Runoff and Drainage Plan which shows the existing contours and drainage area boundaries. The proposed grading plan is shown in drawings listed in Section 7.0 below.

6.0 Drainage of Project Site Narrative

The completed power block complex will be fully developed with either asphalt paving or aggregate surfacing. Currently, the area is partially developed and covered with grass and incidental, small vegetation, except where roadway surfaces and the remnants of abandoned foundations remain. Storm water runoff generally flows to the northwest, directed by swales and a concrete line ditch to the Palomar Trench, which discharges into San Diego Bay. Existing onsite berms contain much of the storm water runoff, which ponds within the bermed area and eventually leaves the site through evapotranspiration. Low points in the southwest and southeast corners of the site collect the remaining runoff for the south half of the site.

Site drainage within the new power block complex will be based on a system of swales, trenches, and culverts leading to a storm water detention basin that is south of the power block complex. Storm water collected in the detention basin will be discharged through a regulating structure that will limit peak discharge rates to flows no greater than the corresponding values for the present site. From the detention basin, the storm water will be routed through a 15 inch corrugated metal pipe and discharge at the existing concrete-lined ditch. Site Grading and Drainage Plans (listed in Section 7.0) show the proposed general drainage scheme and a conceptual site grading plan.

5.81 acres contribute to pre-development flow to the existing concrete ditch, resulting in a peak discharge of 11 cfs (cubic feet per second). Post-development will direct 20.28 acres through a detention basin and into the concrete ditch. The detention basin has been designed to limit peak post-development discharge to 9 cfs. See Attachment C for the summary pages from the hydraulic analysis (computer modeling output not included).

7.0 Clearing and Grading Plans

The grading plan drawings are listed below and can be found in Attachment A.

Grading and Drainage – Site Key Plan	136469-CSTF-S3000
Grading and Drainage Plan Sheets	136469-CSTF-S3001 through S3005
Site Grading and Drainage Typical Details	136469-CSTF-S3900

8.0 Clearing and Grading Narrative

The table below quantifies the total soil volumes removed for demolition. In most cases, the soil will be returned to its original location.

Table 7-1
Demolition Soil Volumes

Description	Qty	Units	End Use
Phase I Demolition			
LNG Foundations	500	CY	Replaced where removed (see note 1)
South Tank Farm and Eastern Berm Area	4200	CY	Moved to North Tank Farm
TOTAL PHASE I SOIL VOLUMES	4700	CY	
Phase II Demolition			
Power Plant Structures	10,000	CY	Replaced where removed (see note 1)
Support Structures	1,000	CY	Replaced where removed (see note 1)
Support Tanks and Equipment	0	CY	
Support Tanks and Equipment Cont	0	CY	
South Tank Farm Tanks & Berms	8,000	CY	Replaced where removed (see note 1)
CW Intake / Discharge Structure	1,800	CY	Replaced where removed (see note 1)
East/West Utility Loop	1,500	CY	Replaced where removed (see note 1)
Combustion Turbine Fuel Site	500	CY	Replaced where removed (see note 1)
North Tank Farm Support Structures	1,000	CY	Replaced where removed (see note 1)
Former Wastewater Pond Area	2,000	CY	Replaced where removed (see note 1)
TOTAL PHASE II SOIL VOLUMES	25,800	CY	
Phase III Demolition			
Existing Waste Water Treatment Plant	2,000	CY	Replaced where removed (see note 1)
North Tank Farm Berms	40,000	CY	Replaced where removed (see note 1)
Construction/Demo Support Structures	500	CY	Replaced where removed (see note 1)
Misc. Materials	1,000	CY	Replaced where removed (see note 1)
TOTAL PHASE III SOIL VOLUMES	43,500	CY	
TOTAL SOIL VOLUMES ALL PHASES	**74,000**	**CY**	

Note 1: Soil will be removed to provide access during demolition and will be placed back in the original location once demo activities are completed. This will require double handling of material.

Implementation of the detention basins and ditches will require imported fill to maintain gravity drainage into the existing concrete ditch in the northwest area of the site. Total permanent imported fill material is approximately 166,000 cubic yards.

9.0 Best Management Practices Plan

Best Management Practices (BMPs) control locations and details are shown in following drawings. See Attachment A for drawings.

Erosion and Sediment Control Key Plan	136469-CSTF-S3100
Erosion and Sediment Control Plan Sheets	136469-CSTF-S3101 through S3102
Erosion and Sediment Control Site Details and Sections	136469-SS-3920

10.0 Best Management Practices Narrative

The best management practices used are listed below in the following categories: Erosion Control, Sediment Control, Tracking Control, Wind Erosion Control, Non-storm water control, and Waste Management and Material Pollution Control. See Attachment B for data sheets from the California Stormwater BMP handbook for individual descriptions of each BMP regarding implementation, design, inspection and maintenance.

10.1 Erosion Control

Erosion control, also referred to as soil stabilization, consists of source control measures that are designed to prevent soil particles from detaching and becoming transported in storm water runoff. Erosion control BMPs protect the soil surface by covering or binding soil particles. This project will incorporate erosion control measures required by the contract documents, and other measures selected by the Contractor, Storm Water Pollution Prevention Manager (SWPPM), or Owner. This project will implement the following practices for effective temporary and final erosion control during construction:

(1) Preservation of existing vegetation where required and when feasible.
(2) Application of temporary erosion control to remaining active and nonactive areas as required by the *California Stormwater BMPs Handbook – Construction*, and the contract documents. Reapplication as necessary to maintain effectiveness.
(3) Implementation of temporary erosion control measures at regular intervals throughout the defined rainy season to achieve and maintain the contract's

disturbed soil area requirements. Implementation of erosion control prior to the defined rainy season.

(4) Stabilization of nonactive areas as soon as feasible after the cessation of construction activities.

(5) Erosion control in concentrated flow paths by applying erosion control blankets, seeding, and lining swales as required in the contract documents.

(6) Application of seed to areas deemed substantially complete by the Owner during the defined rainy season.

(7) Application of permanent erosion control to all remaining disturbed soils upon the completion of construction.

Sufficient erosion control materials will be maintained onsite to allow implementation in conformance with Permit requirements and as described in this SWPPP. This includes implementation requirements for active areas and nonactive areas that require deployment before the onset of rain.

Implementation and location of temporary erosion control BMPs are shown on the drawings listed in Section 9.0 and described in this section. The BMPs that will be implemented to control erosion on the construction site include the following:

- EC-1, Scheduling.
- EC-2, Preservation of Existing Vegetation.
- EC-9, Earth Dikes and Drainage Swales.
- EC-10, Velocity Dissipation Devices.

Refer to Attachment B for BMP individual fact sheets.

10.2 Sediment Control

Sediment controls are structural measures that are intended to complement and enhance the selected erosion control measures and to reduce sediment discharges from active construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. This project will incorporate sediment control measures required by the contract documents and other measures selected by the Contractor, SWPPM, or Owner.

Sufficient quantities of temporary sediment control materials will be maintained onsite throughout the duration of the project to allow implementation of temporary sediment controls in the event of predicted rain and for rapid response to failures or emergencies (in conformance with other Permit requirements and as described in the SWPPP). This includes implementation requirements for active areas and nonactive areas before the onset of rain.

Implementation and location of temporary sediment control BMPs are shown on the drawings listed in Section 9.0. The BMPs that will be implemented to control sediment on the construction site include the following:

- SC-1, Silt Fence.

- SC-4, Check Dam.
- SC-9, Straw Bale Barrier.

Refer to Attachment B for BMP individual fact sheets.

10.3 Tracking Control

The following BMPs have been selected to reduce sediment tracking from the construction site onto private or public roads:

- TC-1, Stabilized Construction Entrance/Exit.
- TC-3, Entrance/Outlet Tire Wash.
- SE-7, Street Sweeping and Vacuuming.

Refer to Attachment B for BMP individual fact sheets.

10.4 Wind Erosion Control

The following BMP has been selected to control dust from the construction site:

- WE-1, Wind Erosion Control.

10.5 Nonstorm Water Control

The following is a list of construction materials that will be used and that will have the potential to contribute pollutants (other than sediment) to storm water runoff.

- Vehicle fluids, including oil, grease, petroleum, and coolants.
- Asphaltic emulsions associated with asphalt-concrete paving operations.
- Cement materials associated with portland cement concrete (PCC) paving operations, drainage structures, median barriers, and bridge construction.
- Base and subbase material.
- Joint and curing compounds.
- Concrete curing compounds.
- Paints.
- Solvents, thinners, acids.
- Sandblasting materials.
- Mortar mix.
- Raw landscaping materials and wastes (topsoil, plant materials, herbicides, fertilizers, mulch, pesticides).
- BMP materials (sandbags, liquid copolymer).
- Treated lumber (materials and waste).
- PCC rubble.
- Masonry block rubble.
- General litter.

Construction activities that have the potential to contribute sediment to storm water discharges include the following:

- Clearing and grubbing operations.
- Grading operations.
- Soil import operations.
- Utility excavation operations.
- Sandblasting operations.
- Landscaping operations.

The following list indicates the BMPs that have been selected to control nonstorm water pollution on the construction site:

- NS-6, Illicit Connection/Illegal Discharge Detection and Reporting.
- NS-8, Vehicle and Equipment Cleaning.
- NS-9, Vehicle and Equipment Fueling.
- NS-10, Vehicle and Equipment Maintenance.
- NS-12, Concrete Curing.
- NS-13, Concrete Finishing.

Implementation and location of some nonstorm water control BMPs are shown on the drawings listed in Section 9.0.

Refer to Attachment B for BMP individual fact sheets.

10.6 Waste Management and Materials Pollution Control

The following list indicates the BMPs that have been selected to handle materials and control construction site wastes:

- WM-1, Material Delivery and Storage.
- WM-2, Material Use.
- WM-3, Stockpile Management.
- WM-4, Spill Prevention and Control.
- WM-5, Solid Waste Management.
- WM-9, Sanitary/Septic Waste Management.

Refer to Attachment B for BMP individual fact sheets.

10.7 Implementation Schedule

In general, the plant will be constructed following the sequence indicated below:

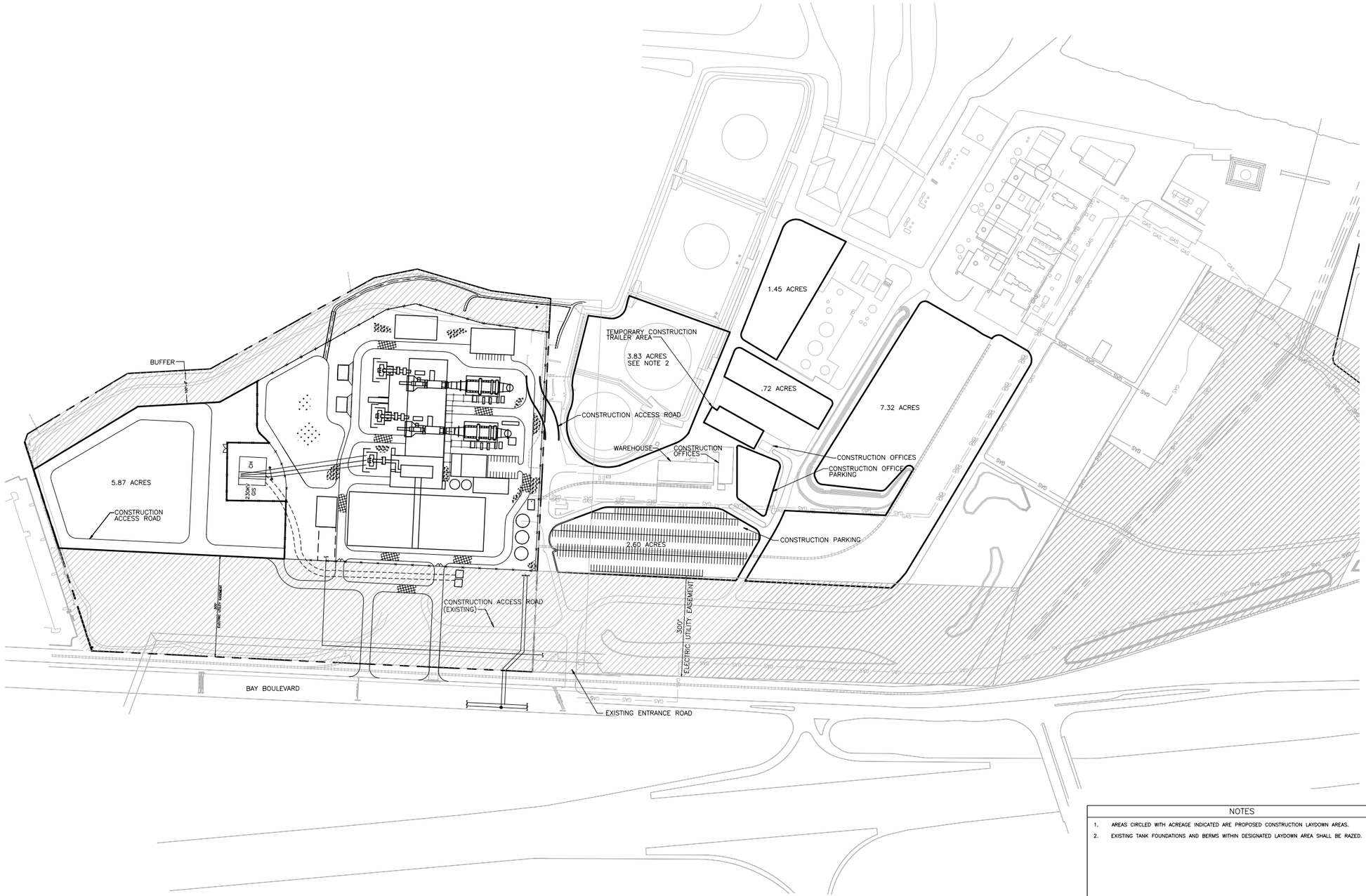
Phase 1:

- Install sediment control BMPs on the perimeter of the construction area(s), where necessary.
- Demolish all former building and equipment foundations.
- Strip ground surface in preparation for site fill material.
- Treat or dispose of contaminated materials according to applicable regulations.
- Haul earthen fill material to site and place and compact the fill material according to required levels.
- Provide temporary stabilization of site area.
- Construct storm water collection system.
- Install internal sediment control BMPs, and connect storm water drains to the existing outfall structures.
- Install underground utilities.
- Construct major foundations.

Phase 2:

- Erect major equipment and buildings.
- Finish road surfaces.
- Perform final site grading.
- Complete stabilization (paving) of site.
- Submit Notice of Termination.
- Remove temporary BMPs.

Attachment A



NOTES

1. AREAS CIRCLED WITH ACREAGE INDICATED ARE PROPOSED CONSTRUCTION LAYDOWN AREAS.
2. EXISTING TANK FOUNDATIONS AND BERMS WITHIN DESIGNATED LAYDOWN AREA SHALL BE RAZED.

NOT TO BE USED FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
C	05/08/06	CLIENT REVIEW	AET	RDN			CJS
B	04/04/06	CLIENT REVIEW	AET	RDN			CJS
A	03/29/06	CLIENT REVIEW	AET	RDN			CJS

SCALE: 1" = 100'

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CALIFORNIA.
SIGNED
DATE REG NO.

BLACK & VEATCH CORPORATION
ENGINEER RDN DRAWN AET
CHECKED DATE

DUKE ENERGY
SOUTH BAY REPLACEMENT GENERATION FACILITY

SITE CONSTRUCTION FACILITIES PLAN

PROJECT DRAWING NUMBER: 136469–DS–3801
REV: C
CODE
AREA

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05/05/06 15:04:52

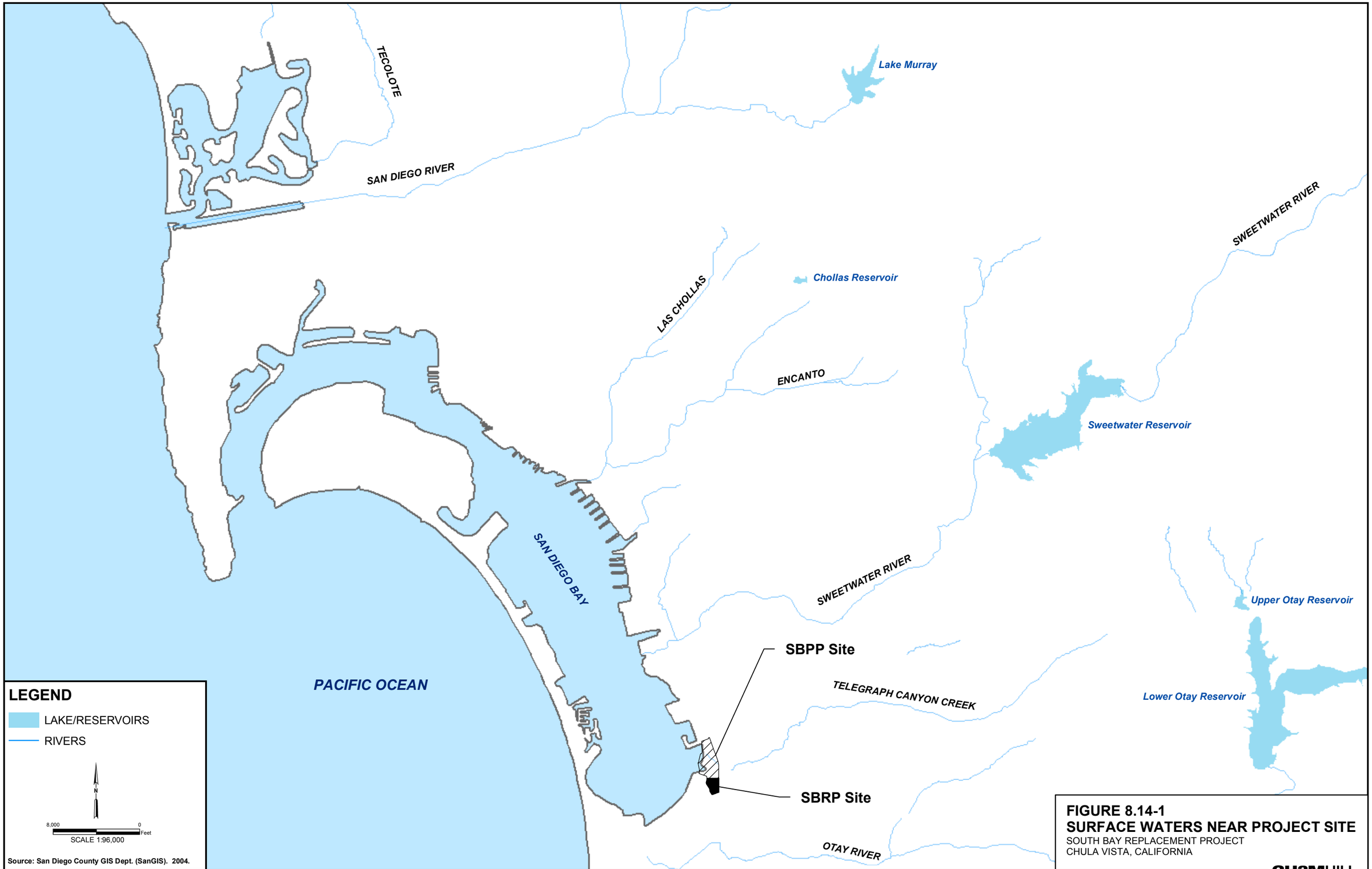
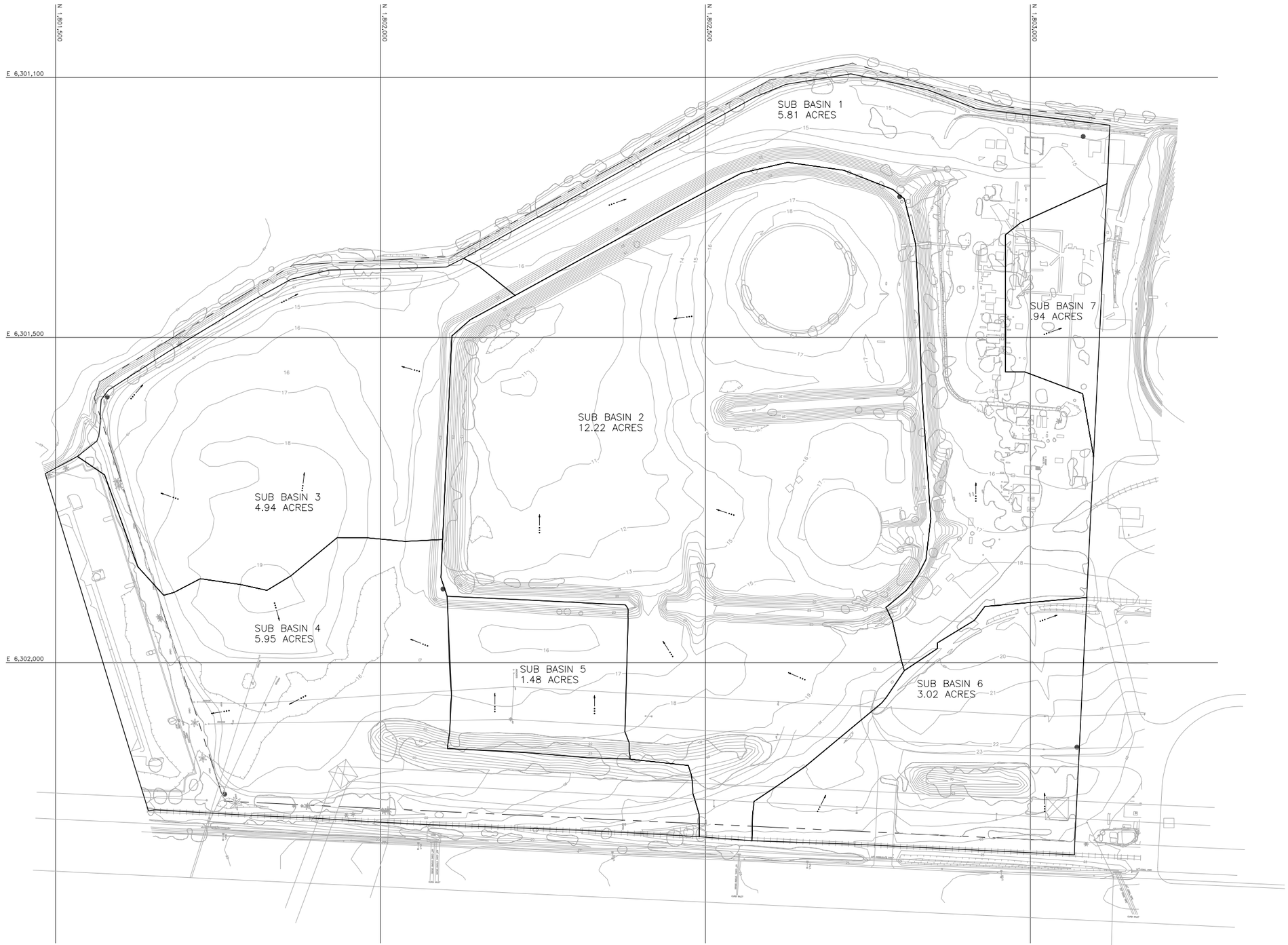


FIGURE 8.14-1
SURFACE WATERS NEAR PROJECT SITE
SOUTH BAY REPLACEMENT PROJECT
CHULA VISTA, CALIFORNIA

CH2MHILL

File Path: Glacier\SACGIS\DukeEnergy\MapFiles\Surface_Hydro.mxd, Date: June 22, 2006,



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FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
A	1/19/06	CLIENT REVIEW	AET	RDN			

SCALE: 1" =50'

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SIGNED
DATE REG NO.

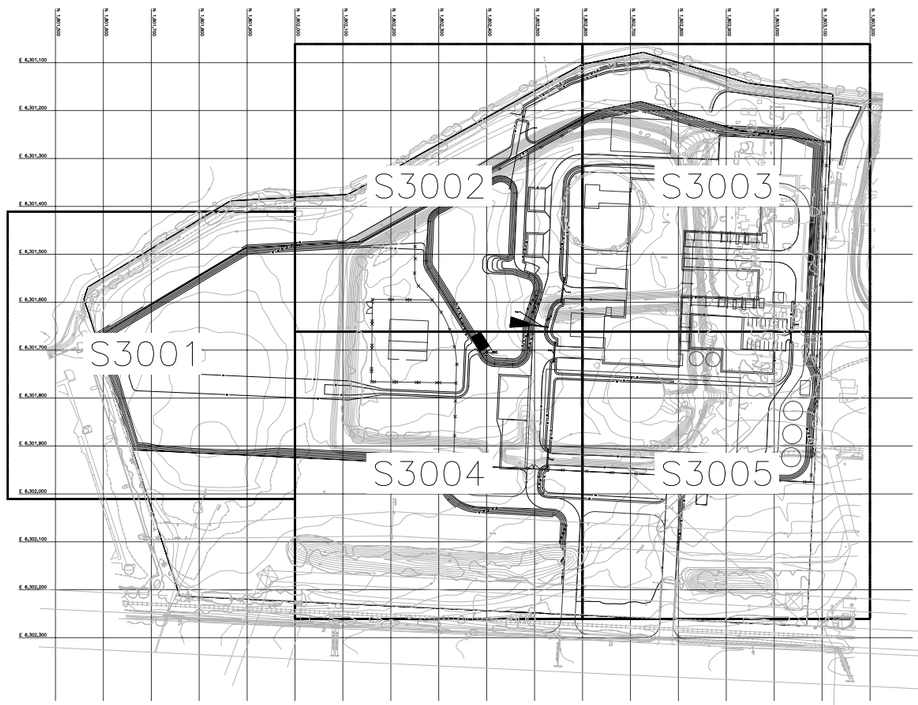
BLACK & VEATCH CORPORATION
ENGINEER DRAWN
CHECKED DATE

DUKE ENERGY
SOUTH BAY REPLACEMENT GENERATION FACILITY

PRE-CONSTRUCTION
RUN-OFF AND DRAINAGE PLAN

PROJECT DRAWING NUMBER: 136469-SS-0001
REV: A
CODE
AREA

TKW46837 E1
ACAD 15.05
LAYOUT 1
01/19/06 16:11:24



LEGEND APPLICABLE TO ALL S3000 DRAWINGS

- PROPERTY LINE
- R/W — LIMIT OF RIGHT-OF-WAY
- NEW SECURITY FENCE
- SWITCHYARD FENCE
- 99 — NEW CONTOUR
- AREA INLET
- NEW STORM WATER SYSTEM
- C-1 — NEW CULVERT
- DITCH/SWALE FLOW INDICATOR
- GRADE SURFACE FLOW INDICATOR
- 123.45 + — NEW SPOT ELEVATION
- SURVEY CONTROL MONUMENT
- EXISTING FENCE
- 99 — EXISTING CONTOUR
- NEW TRENCH DRAIN SEE NOTE 6
- ASPHALT SURFACING
- AGGREGATE SURFACING
- CONCRETE
- EARTH
- RIPRAP
- SAND/BEDDING MAT'L
- GRASS
- WETLANDS
- 1 / S3000 — SECTION OR DETAIL NUMBER / DRAWING DESIGNATION NUMBER

ABBREVIATIONS APPLICABLE TO ALL S3000 DRAWINGS

A	ARC LENGTH	LS	LIFT STATION
AGG	AGGREGATE	LTR	LATER
APPROX	APPROXIMATE	MATL	MATERIAL
ASPH	ASPHALT	MH	MANHOLE
AVG	AVERAGE	MSL	MEAN SEA LEVEL
BLDG	BUILDING	MW	MONITORING WELL
B/MH	BOTTOM OF MANHOLE ELEVATION	N	NORTH
BOD	BOTTOM OF ELECTRICAL DUCT BANK	NO.	NUMBER
BOP	BOTTOM OF PIPE	NTS	NOT TO SCALE
BU	BELL UP	OD	OUTSIDE DIAMETER
CHDPE	CORRUGATED HIGH DENSITY POLYETHYLENE PIPE	OWS	OIL/WATER SEPARATOR
CJ	CONTRACTION JOINT	PC	POINT OF CURVATURE
CL	CENTERLINE	PE	PLAIN END
CMP	CORRUGATED METAL PIPE	PI	POINT OF INTERSECTION
CO	CLEAN OUT	PL	PROPERTY LINE
D	DEGREE OF CURVE	PLCS	PLACES
Δ	DELTA ANGLE OF HORIZONTAL CURVE	PRC	POINT OF REVERSE CURVE
DI	DUCTILE IRON	PT	POINT OF TANGENT
DIA	DIAMETER	PVC	POINT OF VERTICAL CURVE
DIM	DIMENSION	PVI	POINT OF VERTICAL INTERSECTION
DWG	DRAWING	PVT	POINT OF VERTICAL TANGENT
E	EAST	R	RADIUS
EA	EACH	RCP	REINFORCED CONCRETE PIPE
EF	EACH FACE	RD	ROOF DRAIN
EGP	EDGE OF PAVEMENT	RED	REDUCER
EGS	EDGE OF SHOULDER	REQ'D	REQUIRED
EHH	ELECTRICAL HANDHOLE	REV	REVISION
EL	ELEVATION	R/W	RIGHT-OF-WAY
EJ	EXPANSION JOINT	S	SOUTH
EW	EACH WAY	SE	SUPERELEVATION
EXP	EXPANSION	SIM	SIMILAR
FD	FLOOR DRAIN	STA	STATION
FDN	FOUNDATION	T	TANGENT LENGTH
FF	FINISHED FLOOR	TMH	TOP OF MANHOLE
FG	FINISHED GRADE	TOC	TOP OF CONCRETE
FRP	FIBER REINFORCED PIPE	TOG	TOP OF GRATING
FT	FOOT	TOP	TOP OF PAVEMENT
HC	HANDICAPPED	TYP	TYPICAL
HDPE	HIGH DENSITY POLYETHYLENE	UNO	UNLESS NOTED OTHERWISE
HVCM	HORIZ & VERT CONTROL MONUMENT	V	DESIGN SPEED
HP	HIGH POINT	VERT	VERTICAL
ID	INSIDE DIAMETER	W	WEST
IN	INCH	W/	WITH
INV	INVERT	W/O	WITHOUT
L	LENGTH	WP	WORK POINT
LC	LENGTH OF VERTICAL CURVE		

GENERAL NOTES

1. GENERAL NOTES APPLICABLE TO ALL S3000 SERIES DRAWINGS.
2. GRADE BETWEEN NEW CONTOURS SHALL SLOPE UNIFORMLY UNLESS NOTED OTHERWISE.
3. ELEVATION SHOWN ARE TOP OF SURFACING.
4. SEE DRAWING S3900 FOR GRADING AND DRAINAGE DETAILS.
5. PIPE BEDDING SHALL BE CLASS B FOR ALL CULVERTS.
6. SEE DRAWINGS S3900 FOR TYPICAL TRENCH SECTION.

NOT TO BE USED
FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
C	05/24/06	ISSUED FOR OWNER REVIEW	AET	RDN		CJS	
B	05/12/06	ISSUED FOR OWNER REVIEW	AET	RDN		CJS	
A	12/16/05	ISSUED FOR IN-HOUSE REVIEW	SLS	RDN		CJS	

SCALE: 1" = 100' (100' 50' 0 100' 200')

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SIGNED
DATE REG NO.

BLACK & VEATCH CORPORATION
ENGINEER RDN DRAWN SLS
CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

GRADING AND DRAINAGE – SITE
KEY PLAN, GENERAL NOTES AND LEGEND

PROJECT DRAWING NUMBER: 136469–CSTF–S3000
REV: C
CODE
AREA

TAX48537 E1 ACAD 15.05
A4SS7 LST
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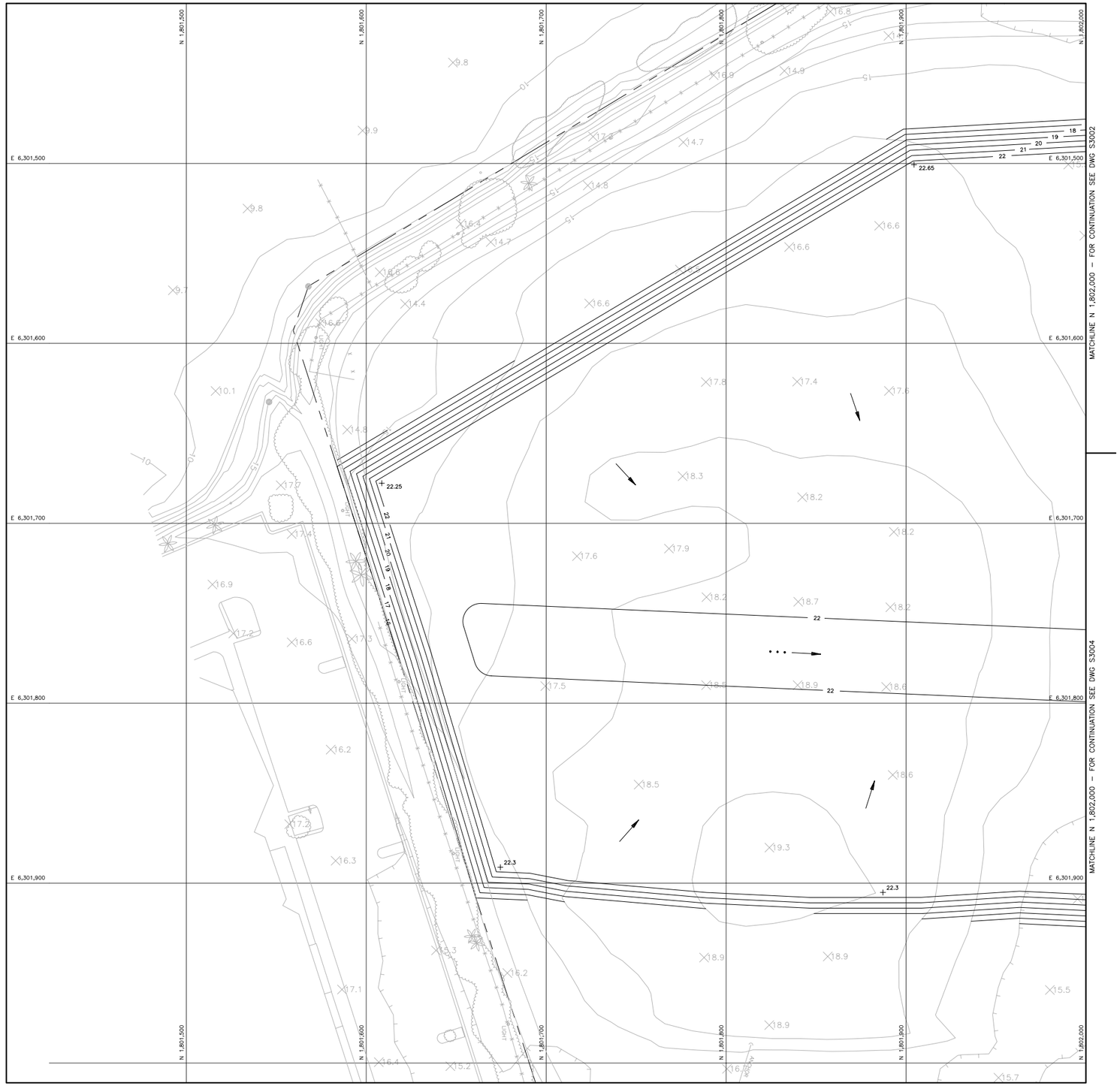
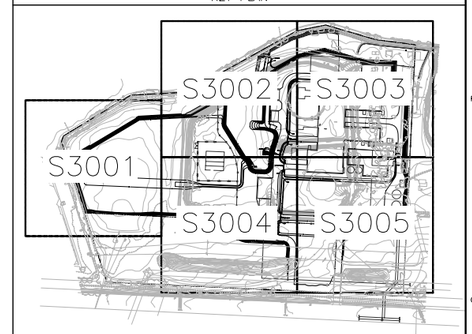


NOTES

1. SEE DRAWING S3000 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

KEY PLAN



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FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
B	05/12/06	ISSUED FOR OWNER REVIEW	AET	RDN		CJS	
A	12/16/05	ISSUED FOR IN-HOUSE REVIEW	SLS	RDN		CJS	

SCALE: 1"=20'

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DATE _____ REG NO. _____

BLACK & VEATCH CORPORATION

ENGINEER RDN DRAWN SLS

CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

GRADING AND DRAINAGE – SITE PLAN – AREA 1

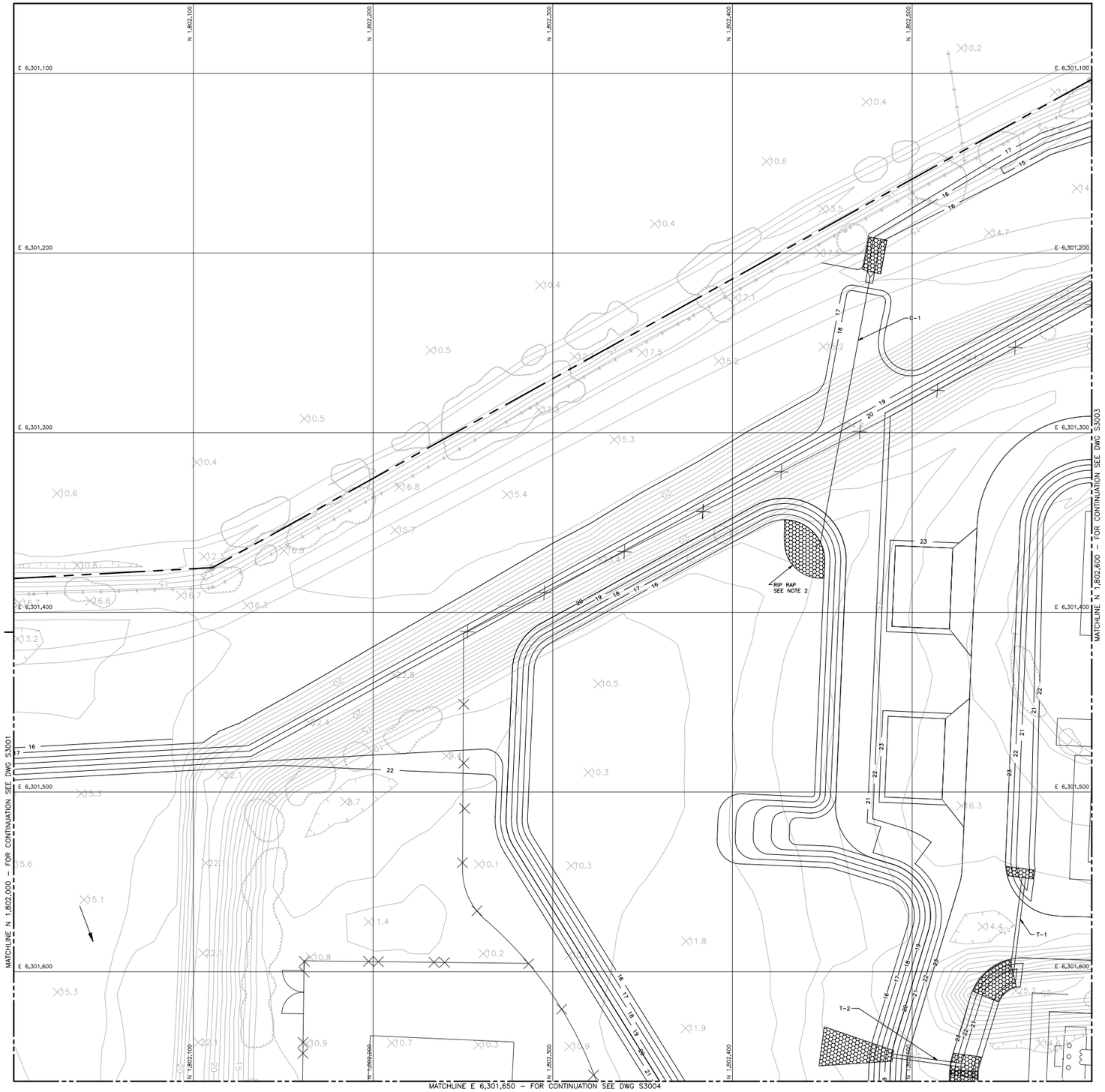
PROJECT DRAWING NUMBER: 136469–CSTF–S3001

REV: B

CODE

AREA

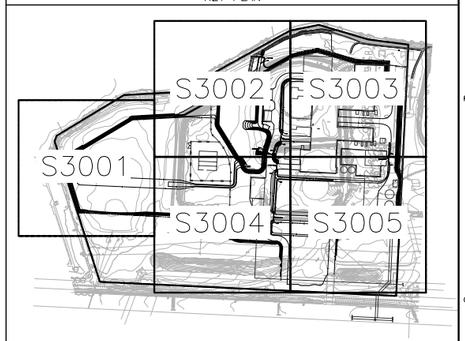
TAY46837 E1 03/02/06 15:52:11
ACAD 15.05 LAS 17



NOTES

1. SEE DRAWING S3000 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. RIP RAP SHALL BE D50 OF 6" AND 9" MINIMUM THICKNESS.

KEY PLAN



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FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
B	05/12/06	ISSUED FOR OWNER REVIEW	AET	RDN		CJS	
A	12/16/05	ISSUED FOR IN-HOUSE REVIEW	SLS	RDN		CJS	

20' 10' 0 20' 40'
SCALE: 1"=20'

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DATE REG NO.

BLACK & VEATCH CORPORATION
ENGINEER RDN DRAWN SLS
CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

GRADING AND DRAINAGE – SITE PLAN – AREA 2

PROJECT DRAWING NUMBER 136469–CSTF–S3002 REV B
CODE
AREA

ACAD 15.05
LAYOUT: E1
TAV46517
ALAN STEWART
03/02/06 12:52:00

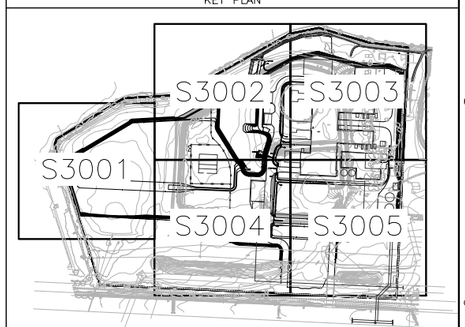
MATCHLINE N 1,802,600 – FOR CONTINUATION SEE DWG S3002

MATCHLINE E 6,301,650 – FOR CONTINUATION SEE DWG S3005

NOTES

1. SEE DRAWING S3000 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

KEY PLAN



NOT TO BE USED
FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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B	05/12/06	ISSUED FOR OWNER REVIEW	AET	RDN		CJS	
A	12/16/05	ISSUED FOR IN-HOUSE REVIEW	SLS	RDN		CJS	

SCALE: 1"=20'

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DATE _____ REG NO. _____

BLACK & VEATCH CORPORATION

ENGINEER RDN DRAWN SLS

CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

GRADING AND DRAINAGE – SITE PLAN – AREA 3

PROJECT 136469 DRAWING NUMBER –CSTF–S3003 REV C

CODE

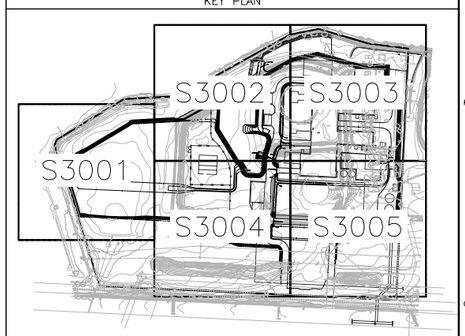
AREA

ACAD 15.05
LAYOUT 1
E1 15:03:43
TXV46837
TXA46037
05/12/06

NOTES

1. SEE DRAWING S3000 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.
2. RIP RAP SHALL BE D50 OF 6" AND 9" MINIMUM THICKNESS.

KEY PLAN



NOT TO BE USED
FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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A	12/16/05	ISSUED FOR IN-HOUSE REVIEW	SLSRDN			CJS	

SCALE: 1"=20' (20' 10' 0 20' 40')

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BLACK & VEATCH CORPORATION

ENGINEER RDN DRAWN SLS
CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

GRADING AND DRAINAGE – SITE PLAN – AREA 4

PROJECT DRAWING NUMBER: 136469–CSTF–S3004
REV: B
CODE
AREA

ACAD 15.05
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E1
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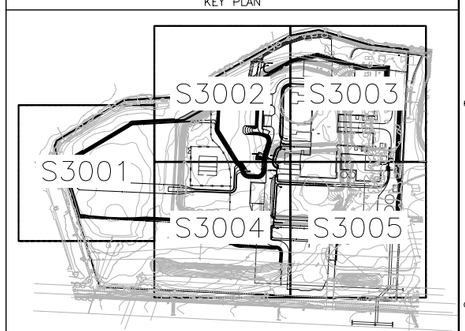
TW46537
03/02/06

NOTES

1. SEE DRAWING S3000 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

KEY PLAN



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FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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A	12/16/05	ISSUED FOR IN-HOUSE REVIEW	SLSRON			CJS	

SCALE: 1"=20'

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ENGINEER RDN | DRAWN SLS
CHECKED | DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

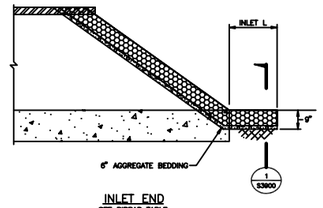
GRADING AND DRAINAGE – SITE PLAN – AREA 5

PROJECT DRAWING NUMBER: 136469–CSTF–S3005
REV: B
CODE
AREA

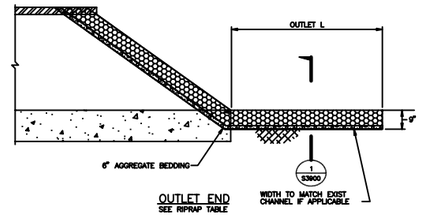
TW46537
A5S3005
03/02/06 15:51:12
E1
1=1
ACAD 15.05

TRENCH DRAIN RIPRAP TABLE			
TRENCH NO.	INLET L	OUTLET L	D50
T-1	5'	19'	6"
T-2	5'	40'	6"
T-3	5'	31'	6"
T-4	5'	17'	6"
T-5	5'	16'	6"

TRENCH DRAIN TABLE							
TRENCH NO.	CENTERLINE COORDINATES				LENGTH	INLET INV ELEVATION	OUTLET INV ELEVATION
	INLET END		OUTLET END				
	NORTH	EAST	NORTH	EAST			
T-1	1802562.13	6301547.69	1802555.34	6301601.28	54	20.39	20.26
T-2	1802529.22	6301652.25	1802489.58	6301646.92	40	20.10	20.00
T-3	1802539.72	6301726.01	1802542.60	6301682.10	44	20.30	20.19
T-4	1802525.70	6301946.09	1802528.32	6301906.18	40	20.85	20.75
T-5	1803035.73	6301853.99	1803034.42	6301883.96	30	21.86	21.79

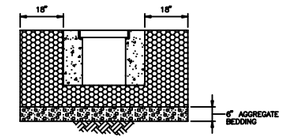


INLET END
SEE RIPRAP TABLE

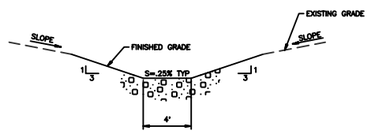


OUTLET END
SEE RIPRAP TABLE

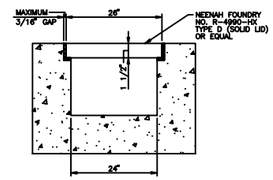
TYPICAL TRENCH RIPRAP
NO SCALE



SECTION 1
NO SCALE
SEE THIS DWG
SEE RIPRAP TABLE



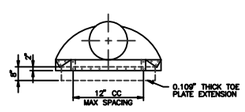
TYPICAL DITCH DETAIL
NO SCALE
SEE PLAN SHEETS



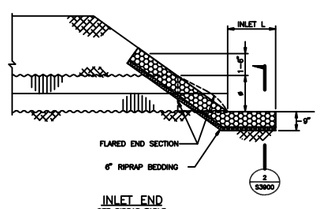
TYPICAL TRENCH SECTION
NO SCALE
SEE PLAN SHEETS

RIPRAP TABLE					
CULVERT NO.	INLET L	OUTLET L	INLET W	OUTLET W	D50
C-1	20'	19'	SEE DWG S3002	SEE DWG S3002	6"

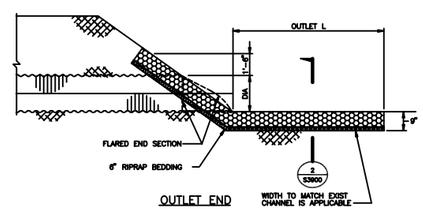
CULVERT TABLE										
CULVERT NO.	CENTERLINE COORDINATES				LENGTH	INLET INV ELEVATION	OUTLET INV ELEVATION	END TYPE	PIPE DIAMETER	PIPE MATERIAL
	INLET END		OUTLET END							
	NORTH	EAST	NORTH	EAST						
C-1	1802448.97	6301360.98	1802476.55	6301213.54	150'	18.00	15.43	FLARED END SECTION	15"	CMP



TYPICAL TREATMENT OF FLARED END SECTION
NO SCALE

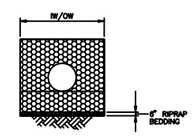


INLET END
SEE RIPRAP TABLE



OUTLET END

TYPICAL CULVERT RIPRAP
NO SCALE



SECTION 2
NO SCALE
SEE THIS DWG
SEE RIPRAP TABLE

NOTES

1. SEE DRAWINGS S3000 – S3005 FOR KEY PLAN, GENERAL NOTES, AND LEGEND.
2. RIP RAP MATERIAL SHALL CONFORM TO THE STANDARD RIP RAP AS DEFINED BY THE CALTRANS SPECIFICATIONS.

NOT TO BE USED FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
A	05/12/06	ISSUED FOR OWNER REVIEW	AET	RDN		CJS	

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SIGNED _____
DATE _____ REG NO. _____

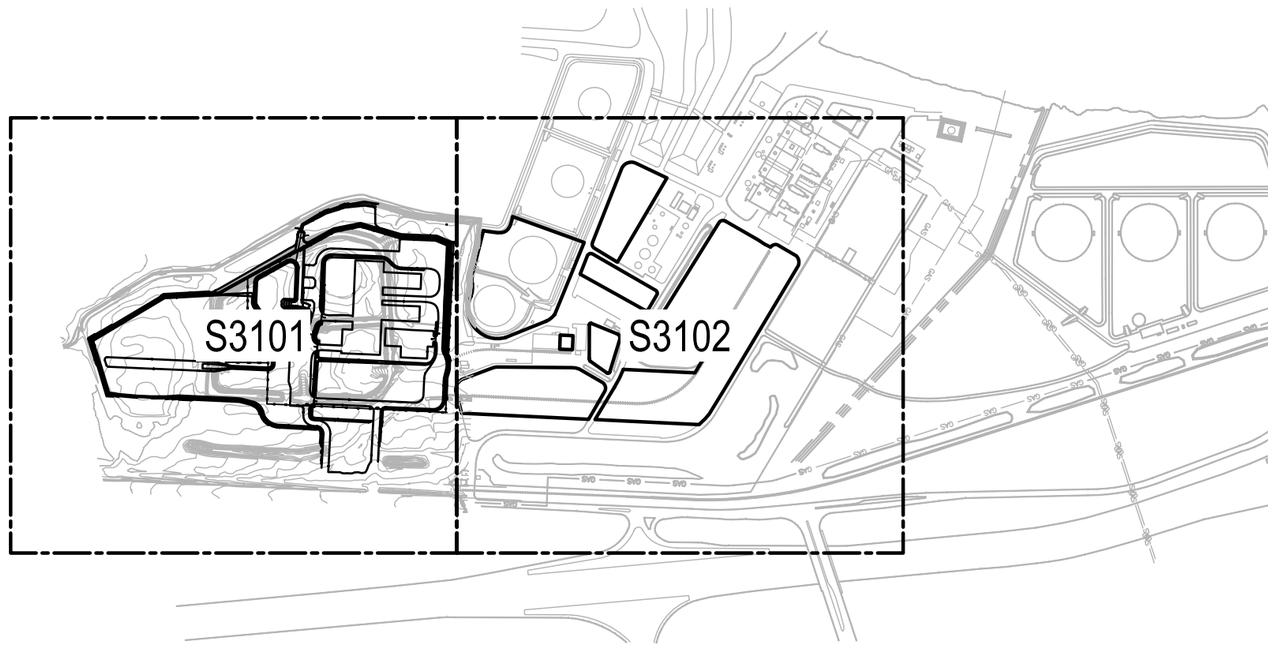
BLACK & VEATCH CORPORATION
ENGINEER RDN DRAWN AET
CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

SITE-GRADING AND DRAINAGE
TYPICAL DETAILS

PROJECT / DRAWING NUMBER: 136469-CSTF-S3900
REV: A
CODE
AREA

ACAD 15.05
RLAND2025
ACAD 2007
04/05/06 13:03:27



SEDIMENT & EROSION CONTROL PLAN NOTES

1. THESE GUIDELINES SHALL APPLY TO ALL WORK CONSISTING OF ANY AND ALL TEMPORARY AND/OR PERMANENT MEASURES TO CONTROL WATER POLLUTION AND SOIL EROSION, AS MAY BE REQUIRED, DURING THE CONSTRUCTION OF THE PROJECT.

2. IN GENERAL, ALL CONSTRUCTION ACTIVITIES SHALL PROCEED IN SUCH A MANNER SO AS NOT TO POLLUTE ANY WETLANDS, WATERCOURSE, WATERBODY, AND CONDUIT CARRYING WATER, ETC.. THE SUBCONTRACTOR SHALL LIMIT, INSOFAR AS POSSIBLE, THE SURFACE AREA OF EARTH MATERIALS EXPOSED BY CONSTRUCTION METHODS AND IMMEDIATELY PROVIDE PERMANENT AND TEMPORARY POLLUTION CONTROL MEASURES TO PREVENT CONTAMINATION OF ADJACENT WETLANDS, WATERCOURSES, AND WATERBODIES, AND TO PREVENT, INSOFAR AS POSSIBLE, EROSION ON THE SITE.

3. PRESERVATION OF EXISTING VEGETATION

   PROVIDE FOR PRESERVATION OF EXISTING VEGETATION PRIOR TO THE COMMENCEMENT OF CLEARING AND GRUBBING OPERATIONS OR OTHER SOIL DISTURBING ACTIVITIES IN AREAS WHERE NO CONSTRUCTION ACTIVITY IS PLANNED OR WILL OCCUR AT A LATER DATE.

4. INLET/OUTLET PROTECTION

   SEE DRAWINGS 136469-CSTF-S3100 – S3102 FOR RIPRAP LOCATIONS AND DRAWING 136469-CSTF-S3920 FOR TYPICAL DETAILS. RIPRAP MATERIAL SHALL CONFORM TO THE STANDARD AS DEFINED BY CALTRANS SPECIFICATIONS.

5. WIND EROSION CONTROL

   A. QUICKLY STABILIZE EXPOSED SOILS USING VEGETATION, MULCHING, SPRAY-ON ADHESIVES, CALCIUM CHLORIDE, SPRINKLING, AND STONE/GRAVEL LAYERING.

   B. IDENTIFY AND STABILIZE KEY ACCESS POINTS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

   C. MINIMIZE THE IMPACT OF DUST BY ANTICIPATING THE DIRECTION OF PREVAILING WINDS.

   D. DIRECT MOST CONSTRUCTION TRAFFIC TO STABILIZED ROADWAYS WITHIN THE PROJECT SITE.

   E. WATER SHOULD BE APPLIED BY MEANS OF PRESURE-TYPE DISTRIBUTORS OR PIPELINES EQUIPPED WITH A SPRAY SYSTEM OR HOSES AND NOZZLES THAT WILL ENSURE EVEN DISTRIBUTION.

   F. ALL DISTRIBUTION EQUIPMENT SHOULD BE EQUIPPED WITH A POSITIVE MEANS OF SHUTOFF.

   G. UNLESS WATER IS APPLIED BY MEANS OF PIPELINES, AT LEAST ONE MOBILE UNIT SHOULD BE AVAILABLE AT ALL TIMES TO APPLY WATER OR DUST PALLIATIVE TO THE PROJECT.

   H. IF RECLAIMED WASTE WATER IS USED, THE SOURCES AND DISCHARGE MUST MEET CALIFORNIA DEPARTMENT OF HEALTH SERVICES WATER RECLAMATION CRITERIA AND THE REGIONAL WATER QUALITY CONTROL BOARD REQUIREMENTS. NON-POTABLE WATER SHOULD NOT BE CONVEYED IN TANKS OR DRAIN PIPES THAT WILL BE USED TO CONVEY POTABLE WATER AND THERE SHOULD BE NO CONNECTION BETWEEN POTABLE AND NON-POTABLE SUPPLIES. NON-POTABLE TANKS, PIPES, AND OTHER CONVEYANCES SHOULD BE MARKED, "NON-POTABLE WATER – DO NOT DRINK".

   I. PROVIDE COVERS FOR HAUL TRUCKS TRANSPORTING MATERIALS THAT CONTRIBUTE TO DUST.

   J. PROVIDE FOR WET SUPPRESSION OR CHEMICAL STABILIZATION OF EXPOSED SOILS.

   K. PROVIDE FOR RAPID CLEAN UP OF SEDIMENTS DEPOSITED ON PAVED ROADS. FURNISH STABILIZED CONSTRUCTION ROAD ENTRANCES AND VEHICLE WASH DOWN AREAS.

   L. STABILIZE INACTIVE CONSTRUCTION SITES USING VEGETATION OR CHEMICAL STABILIZATION METHODS.

   M. IF CHEMICAL STABILIZATION IS USED, THE CHEMICALS SHOULD NOT CREATE ANY ADVERSE EFFECTS ON STORM WATER, PLANT LIFE, OR GROUND WATER.

SITE GRADING

1. THE RESHAPING OF THE GROUND SURFACE BY EXCAVATION AND FILLING OR A COMBINATION OF BOTH, TO OBTAIN PLANNED GRADES, SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:

   A. THE PERMANENT CUT FACE OF EARTH EXCAVATION SHALL NOT BE STEEPER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1), UNLESS NOTED OTHERWISE.

   B. THE PERMANENT EXPOSED FACES OF FILLS SHALL NOT BE STEEPER THAN THREE HORIZONTAL TO ONE VERTICAL (3:1), UNLESS NOTED OTHERWISE.

   C. TEMPORARY CONSTRUCTION FACES OF FILLS AND EXCAVATION CUTS SHALL NOT BE STEEPER THAN ONE AND ONE HALF HORIZONTAL TO ONE VERTICAL (1.5:1).

   D. PROVISION SHOULD BE MADE TO CONDUCT SURFACE WATER SAFELY TO DRAINAGE DITCHES TO PREVENT SURFACE RUNOFF FROM DAMAGING CUT FACES AND FILL SLOPES.

   E. EXCAVATIONS SHOULD NOT BE MADE SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTY WITHOUT PROTECTING SUCH PROPERTY FROM EROSION, SLIDING, SETTLING, OR CRACKING.

   F. NO FILL SHOULD BE PLACED WHERE IT WILL SLIDE OR WASH UPON THE PREMISES OF ANOTHER OWNER OR UPON ADJACENT WETLANDS, WATERCOURSES, OR WATERBODIES.

   G. PRIOR TO ANY REGRADING, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED AT THE ENTRANCE TO THE WORK AREA IN ORDER TO REDUCE MUD AND OTHER SEDIMENTS FROM LEAVING THE SITE.

GENERAL LEGEND

SILT FENCE N 10.94 E 34.39	SILT FENCE		RIPRAP
	CONSTRUCTION LAYDOWN BOUNDARY		WETLANDS
IP	INLET PROTECTION		STABILIZED CONSTRUCTION ENTRANCE
OP	OUTLET PROTECTION	SAP 1	SAMPLING LOCATION (SEE NOTE 7)
CD	CHECK DAM		

GENERAL NOTES

1. SEE THIS DWG FOR GENERAL NOTES AND LEGEND.
2. SEE DWG 136469-STE-S3920 FOR EROSION CONTROL SECTIONS & DETAILS.
3. SUBCONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION CONTROL.
4. EROSION CONTROL MEASURES TO BE INSTALLED BY SUBCONTRACTOR IN ACCORDANCE WITH THE STORMWATER POLLUTION PREVENTION PLAN.
5. SILT FENCE LOCATIONS SHOWN ON DRAWINGS MAY BE RELOCATED AT THE DISCRETION OF THE SITE MANAGER TO ACCOUNT FOR INTERFERENCES WITH PAVEMENTS, ROAD CROSSINGS, WOODED AREAS, ETC. RELOCATION OF SILT FENCE SHALL PROVIDE THE INTENDED SILT BARRIER AND PROTECTION OF UNDISTURBED LAND AS SHOWN ON THE DRAWINGS.
6. AREA SHALL BE ROUGH GRADED WITH BERM REMOVAL PRIOR TO USE.
7. SEE SECTION 6.5 OF STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR SAMPLING AND ANALYSIS PLAN.

NOT TO BE USED FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
B	05/24/06	ISSUED FOR CLIENT REVIEW	AET	RDN		CJS	
A	05/18/06	ISSUED FOR CLIENT REVIEW	AET	RDN		CJS	

200' 100' 0 200' 400'
SCALE: 1"=200'

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CALIFORNIA.
SIGNED
DATE REG NO.

BLACK & VEATCH CORPORATION
ENGINEER RDN DRAWN AET
CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

EROSION AND SEDIMENT CONTROL KEY PLAN

PROJECT DRAWING NUMBER: 136469-CSTF-S3100
REV: B
CODE
AREA

ACAD 15.05
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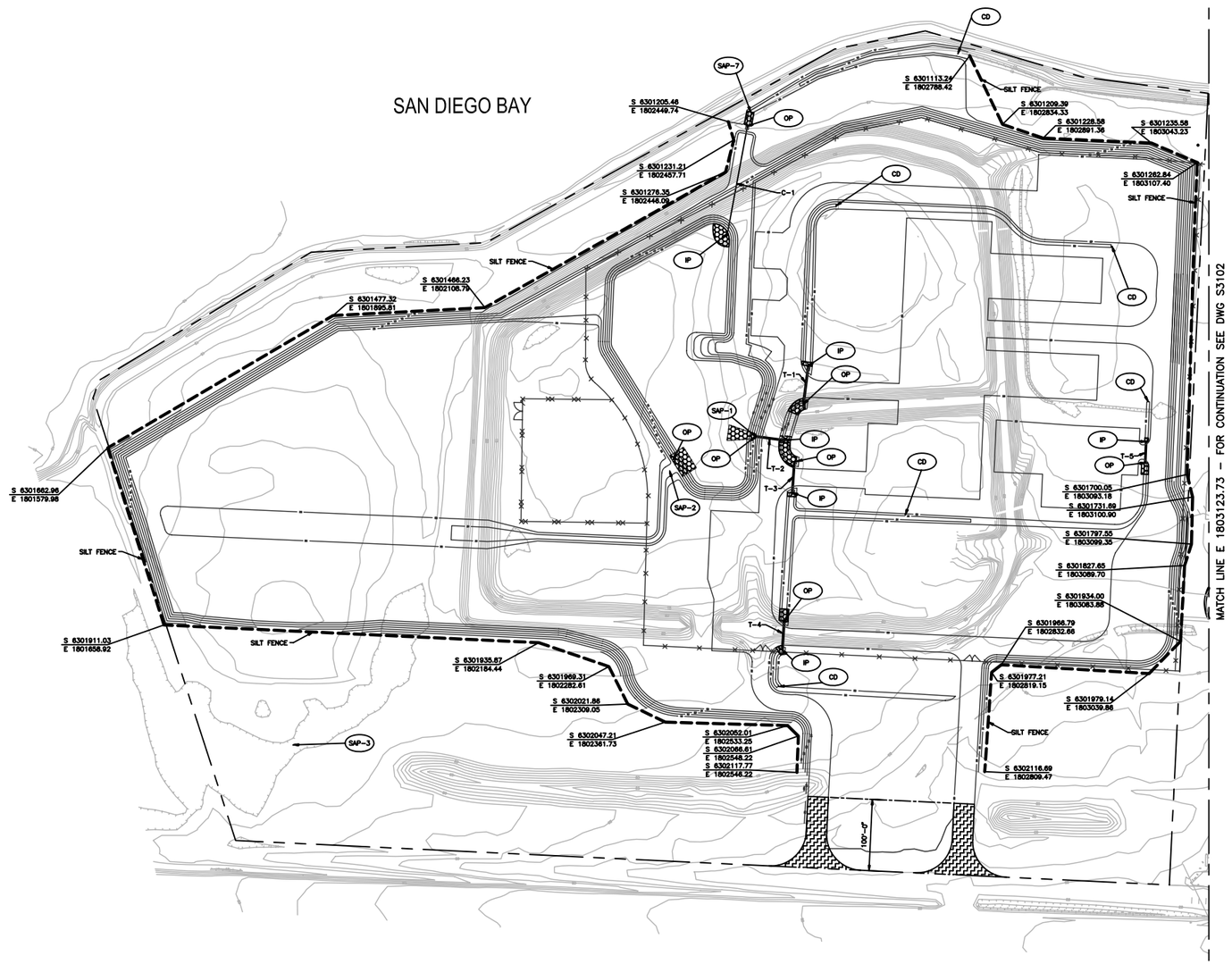
05/18/06 14:15:05



GENERAL NOTES

1. SEE DWG 136469-CSTF-S3100 FOR GENERAL NOTES & LENGEND.

NOT TO BE USED FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
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A	05/18/06	ISSUED FOR CLIENT REVIEW	AETRON			CJS	

N

60' 30' 0 60' 120'
SCALE: 1"=60'

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ENGINEER RON DRAWN AET
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LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

EROSION AND SEDIMENT CONTROL PLAN AREA 1

PROJECT DRAWING NUMBER: 136469-CSTF-S3101
REV: B
CODE
AREA

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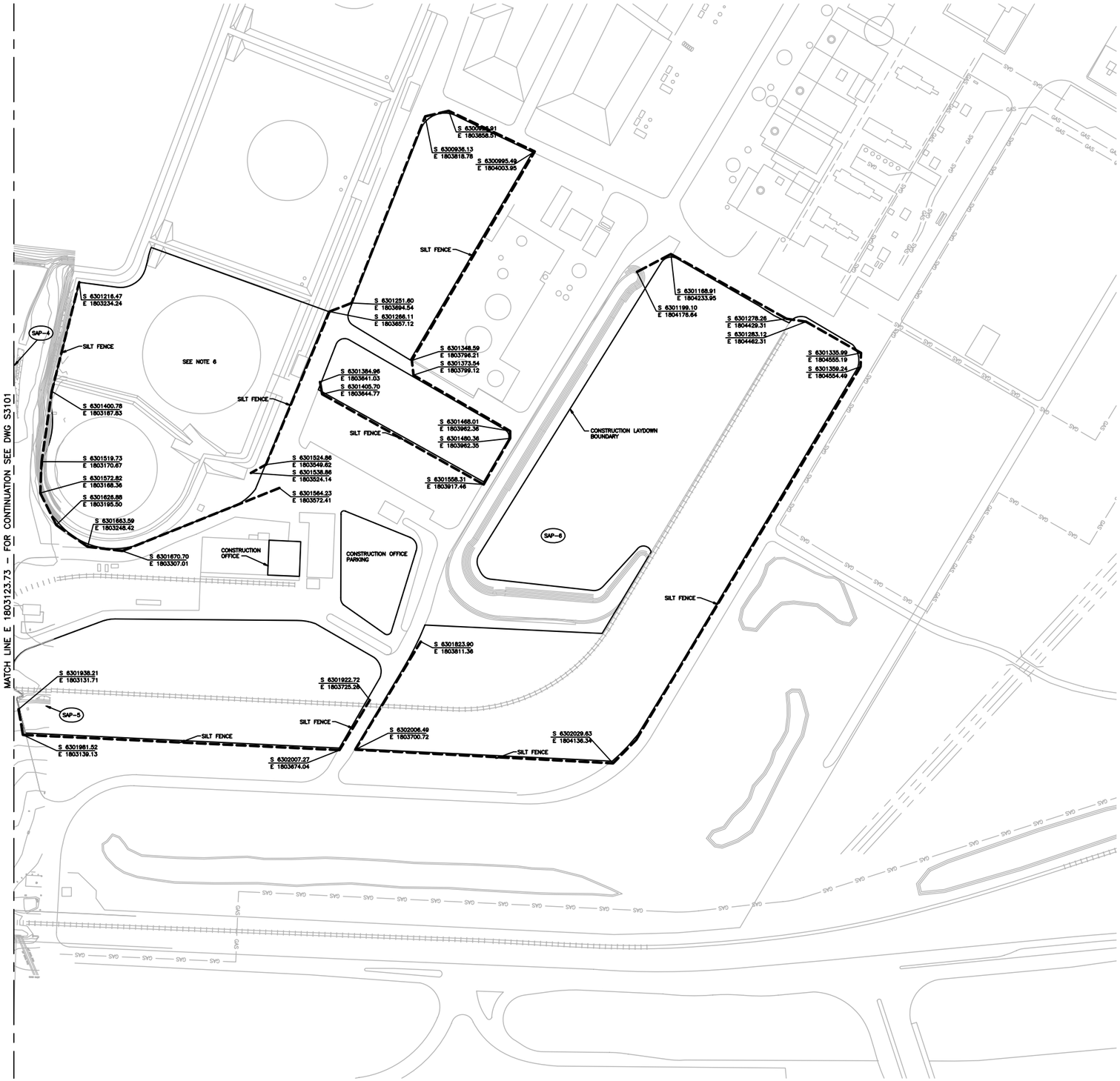

GENERAL NOTES

1. SEE DWG 136469-CSTF-S3100 FOR GENERAL NOTES & LEGEND.

NOT TO BE USED FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRAWN	DESIGN	CHKD	APPD
A	05/18/06	ISSUED FOR CLIENT REVIEW	ACT/RDN		CJS	

60' 30' 0 60' 120'
SCALE: 1"=60'

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SIGNED
DATE REG NO.

BLACK & VEATCH CORPORATION
ENGINEER RDN DRWN AET
CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY

EROSION AND SEDIMENT CONTROL PLAN AREA 2

PROJECT DRAWING NUMBER 136469-CSTF-S3102 REV A
CODE
AREA

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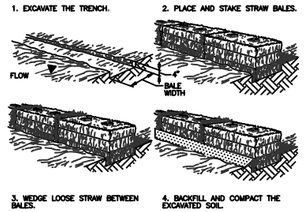
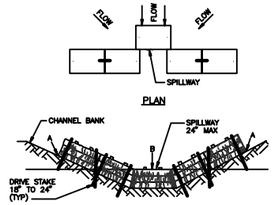
05/18/06 10:04:00

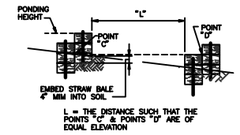


STRAW BALE BARRIER CONSTRUCTION DETAIL
NO SCALE

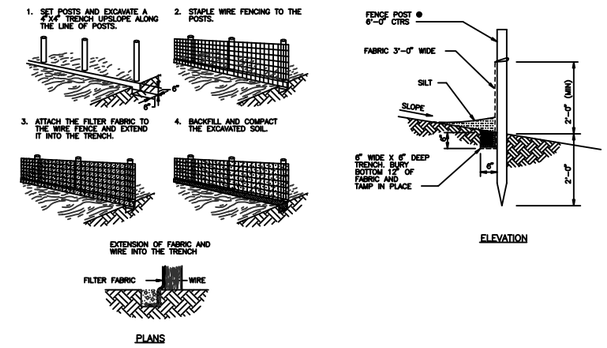


NOTES:
1. EMBED BALES 4" INTO SOIL AND "KEY" BALES INTO CHANNEL BANKS.
2. POINT "A" MUST BE HIGHER THAN POINT "B" (SPILLWAY HEIGHT)
3. PLACE BALES PERPENDICULAR TO THE FLOW WITH ENDS TIGHTLY ABUTTING.
4. SPILLWAY HEIGHT SHALL NOT EXCEED 24".
5. INSPECT AFTER EACH SIGNIFICANT STORM, MAINTAIN AND REPAIR PROMPTLY.

STRAW BALE CHECK DAM IN DRAINAGE WAY
NO SCALE

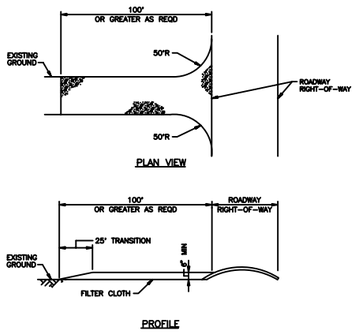


SPACING BETWEEN CHECK DAMS
NO SCALE

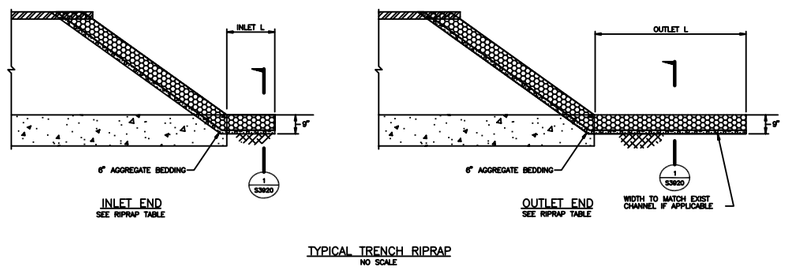


SILT FENCE DETAIL
NO SCALE

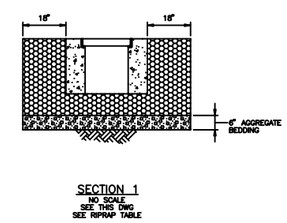
TRENCH DRAIN RIPRAP TABLE			
TRENCH NO.	INLET L	OUTLET L	D50
T-1	5'	19"	6"
T-2	5'	40"	6"
T-3	5'	31"	6"
T-4	5'	17"	6"
T-5	5'	16"	6"



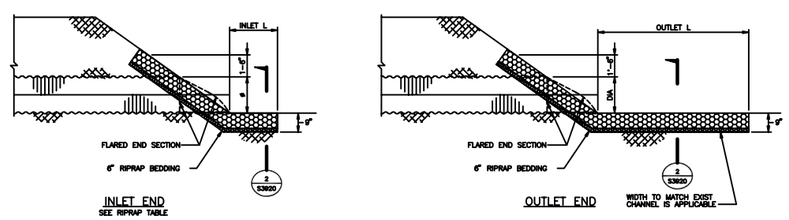
TYPICAL STABILIZED CONSTRUCTION ENTRANCE
NO SCALE
SEE NOTE 2, 3, AND 4



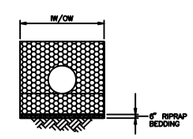
TYPICAL TRENCH RIPRAP
NO SCALE



CULVERT RIPRAP TABLE					
CULVERT NO.	INLET L	OUTLET L	INLET W	OUTLET W	D50
C-1	20'	19"	SEE DWG S3002	SEE DWG S3002	6"



TYPICAL CULVERT RIPRAP
NO SCALE



SECTION 2
NO SCALE
SEE THIS DWG
SEE RIPRAP TABLE

NOTES

1. SEE DWG S3100 FOR GENERAL NOTES AND LEGEND.
2. PROVIDE APPROPRIATE TRANSITION BETWEEN STABILIZED CONSTRUCTION ENTRANCE AND PUBLIC R.O.W.
3. DESIGN CRITERIA FOR STABILIZED CONSTRUCTION ENTRANCE.
   A. STONE SIZE – USE ASTM C-33, SIZE NO 2 OR 3, USE CRUSHED STONE.
   B. THICKNESS – NOT LESS THAN 8 INCHES.
   C. WIDTH – NOT LESS THAN FULL WIDTH OF POINTS OF INGRESS OR EGRESS.
   D. LENGTH – 100 FEET MINIMUM
      WHERE SOILS ARE CLAYS OR SILTS, EXCEPT WHERE THE TRAVELED LENGTH IS LESS THAN 100 FEET. THIS LENGTH MAY BE INCREASED WHERE FIELD CONDITIONS DICTATE.
   E. FILTER CLOTH – WILL BE PLACED OVER ENTIRE AREA PRIOR TO PLACING OF STONE.
   F. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ON TO PUBLIC RIGHT-OF-WAY THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.
4. TRACKING CONTROL: ENTRANCE/OUTLET TIRE WASH
   A. INCORPORATE WITH A STABILIZED CONSTRUCTION ENTRANCE/EXIT.
   B. CONSTRUCT ON LEVEL GROUND WHEN POSSIBLE, ON A PAD OF COARSE AGGREGATE GREATER THAN 3 IN. BUT SMALLER THAN 8 IN. A GEOTEXTILE FABRIC SHOULD BE PLACED BELOW THE AGGREGATE.
   C. WASH RACK SHOULD BE DESIGNED AND CONSTRUCTED/MANUFACTURED FOR ANTICIPATED TRAFFIC LOADS.
   D. PROVIDE A TEMPORARY DRAINAGE DITCH THAT WILL CONVEY THE RUNOFF FROM THE WASH AREA TO A SEDIMENT TRAPPING DEVICE. THE DRAINAGE DITCH SHOULD BE OF SUFFICIENT GRADE, WIDTH, AND DEPTH TO CARRY THE WASH RUNOFF.
   E. USE HOSES WITH AUTOMATIC SHUTOFF NOZZLES TO PREVENT HOSES FROM BEING LEFT ON.
   F. REQUIRE THAT ALL EMPLOYEES, SUBCONTRACTORS, AND OTHERS THAT LEAVE THE SITE WITH MUD CAKED TIRES AND UNDERCARRIAGES TO USE THE WASH FACILITY.
   G. VISIBLE SEDIMENT TRACKING SHOULD BE SWEPT OR VACUUMED AND INSPECTED ON A DAILY BASIS.

NOT TO BE USED FOR CONSTRUCTION

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
A	05/18/06	ISSUED FOR CLIETN REVIEW	AET	RDN			

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SIGNED
DATE REG NO.

BLACK & VEATCH CORPORATION
ENGINEER DRAWN
CHECKED DATE

LS POWER
SOUTH BAY REPLACEMENT GENERATION FACILITY
ERSOSION AND SEDIMENT CONTROL SECTIONS AND DETAILS

PROJECT DRAWING NUMBER: 136469-CSTF-S3920
REV: A
CODE
AREA

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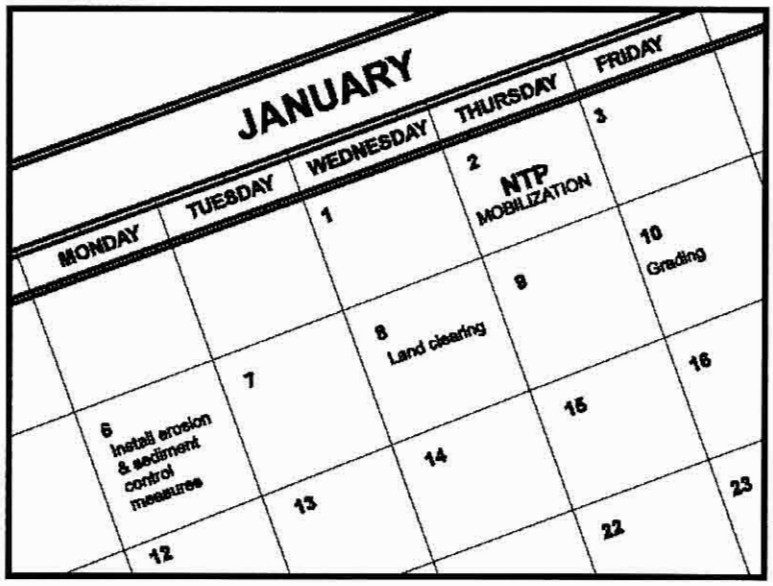
Attachment B

Scheduling

EC-1



Objectives

EC	Erosion Control	☑
SE	Sediment Control	☒
TR	Tracking Control	☒
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ Primary Objective

☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Scheduling is the development of a written plan that includes sequencing of construction activities and the implementation of BMPs such as erosion control and sediment control while taking local climate (rainfall, wind, etc.) into consideration. The purpose is to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking, and to perform the construction activities and control practices in accordance with the planned schedule.

Suitable Applications

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project especially during rainy season. Use of other, more costly yet less effective, erosion and sediment control BMPs may often be reduced through proper construction sequencing.

Limitations

- Environmental constraints such as nesting season prohibitions reduce the full capabilities of this BMP.

Implementation

- Avoid rainy periods. Schedule major grading operations during dry months when practical. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install sediment trapping devices.
- Plan the project and develop a schedule showing each phase of construction. Clearly show how the rainy season relates to soil

disturbing and re-stabilization activities. Incorporate the construction schedule into the SWPPP.

- Include on the schedule, details on the rainy season implementation and deployment of:
  - Erosion control BMPs
  - Sediment control BMPs
  - Tracking control BMPs
  - Wind erosion control BMPs
  - Non-stormwater BMPs
  - Waste management and materials pollution control BMPs
- Include dates for activities that may require non-stormwater discharges such as dewatering, sawcutting, grinding, drilling, boring, crushing, blasting, painting, hydro-demolition, mortar mixing, pavement cleaning, etc.
- Work out the sequencing and timetable for the start and completion of each item such as site clearing and grubbing, grading, excavation, paving, foundation pouring utilities installation, etc., to minimize the active construction area during the rainy season.
  - Sequence trenching activities so that most open portions are closed before new trenching begins.
  - Incorporate staged seeding and re-vegetation of graded slopes as work progresses.
  - Schedule establishment of permanent vegetation during appropriate planting time for specified vegetation.
- Non-active areas should be stabilized as soon as practical after the cessation of soil disturbing activities or one day prior to the onset of precipitation.
- Monitor the weather forecast for rainfall.
- When rainfall is predicted, adjust the construction schedule to allow the implementation of soil stabilization and sediment treatment controls on all disturbed areas prior to the onset of rain.
- Be prepared year round to deploy erosion control and sediment control BMPs. Erosion may be caused during dry seasons by un-seasonal rainfall, wind, and vehicle tracking. Keep the site stabilized year round, and retain and maintain rainy season sediment trapping devices in operational condition.
- Apply permanent erosion control to areas deemed substantially complete during the project's defined seeding window.

Costs

Construction scheduling to reduce erosion may increase other construction costs due to reduced economies of scale in performing site grading. The cost effectiveness of scheduling techniques should be compared with the other less effective erosion and sedimentation controls to achieve a cost effective balance.

Inspection and Maintenance

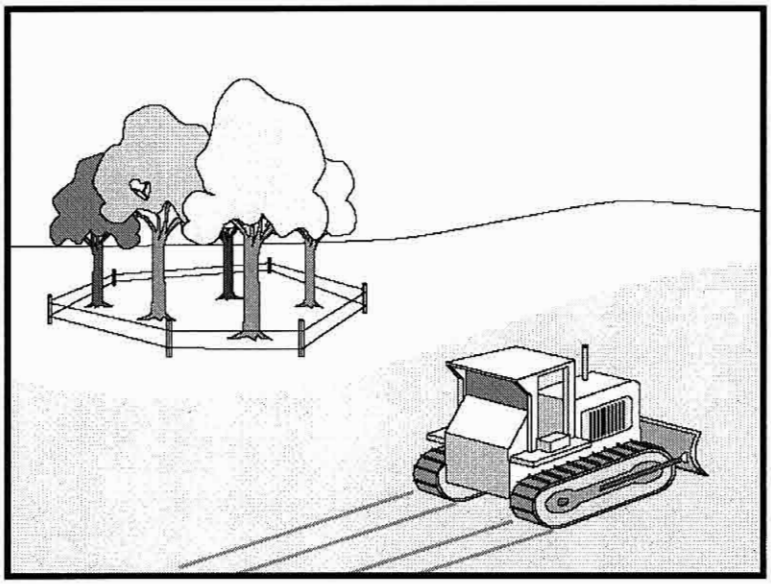
- Verify that work is progressing in accordance with the schedule. If progress deviates, take corrective actions.
- Amend the schedule when changes are warranted.
- Amend the schedule prior to the rainy season to show updated information on the deployment and implementation of construction site BMPs.

References

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities Developing Pollution Prevention Plans and Best Management Practices (EPA 832-R-92-005), U.S. Environmental Protection Agency, Office of Water, September 1992.

Preservation Of Existing Vegetation EC-2



Objectives

EC	Erosion Control	☑
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ Primary Objective

☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs, and grasses that protect soil from erosion.

Suitable Applications

Preservation of existing vegetation is suitable for use on most projects. Large project sites often provide the greatest opportunity for use of this BMP. Suitable applications include the following:

- Areas within the site where no construction activity occurs, or occurs at a later date. This BMP is especially suitable to multi year projects where grading can be phased.
- Areas where natural vegetation exists and is designated for preservation. Such areas often include steep slopes, watercourse, and building sites in wooded areas.
- Areas where local, state, and federal government require preservation, such as vernal pools, wetlands, marshes, certain oak trees, etc. These areas are usually designated on the plans, or in the specifications, permits, or environmental documents.
- Where vegetation designated for ultimate removal can be temporarily preserved and be utilized for erosion control and sediment control.

EC-2 Preservation Of Existing Vegetation

Limitations

- Requires forward planning by the owner/developer, contractor, and design staff.
- Limited opportunities for use when project plans do not incorporate existing vegetation into the site design.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactory for the planned development.

Implementation

The best way to prevent erosion is to not disturb the land. In order to reduce the impacts of new development and redevelopment, projects may be designed to avoid disturbing land in sensitive areas of the site (e.g., natural watercourses, steep slopes), and to incorporate unique or desirable existing vegetation into the site's landscaping plan. Clearly marking and leaving a buffer area around these unique areas during construction will help to preserve these areas as well as take advantage of natural erosion prevention and sediment trapping.

Existing vegetation to be preserved on the site must be protected from mechanical and other injury while the land is being developed. The purpose of protecting existing vegetation is to ensure the survival of desirable vegetation for shade, beautification, and erosion control. Mature vegetation has extensive root systems that help to hold soil in place, thus reducing erosion. In addition, vegetation helps keep soil from drying rapidly and becoming susceptible to erosion. To effectively save existing vegetation, no disturbances of any kind should be allowed within a defined area around the vegetation. For trees, no construction activity should occur within the drip line of the tree.

Timing

- Provide for preservation of existing vegetation prior to the commencement of clearing and grubbing operations or other soil disturbing activities in areas where no construction activity is planned or will occur at a later date.

Design and Layout

- Mark areas to be preserved with temporary fencing. Include sufficient setback to protect roots.
  - Orange colored plastic mesh fencing works well.
  - Use appropriate fence posts and adequate post spacing and depth to completely support the fence in an upright position.
- Locate temporary roadways, stockpiles, and layout areas to avoid stands of trees, shrubs, and grass.
- Consider the impact of grade changes to existing vegetation and the root zone.
- Maintain existing irrigation systems where feasible. Temporary irrigation may be required.
- Instruct employees and subcontractors to honor protective devices. Prohibit heavy equipment, vehicular traffic, or storage of construction materials within the protected area.

Costs

There is little cost associated with preserving existing vegetation if properly planned during the project design, and these costs may be offset by aesthetic benefits that enhance property values. During construction, the cost for preserving existing vegetation will likely be less than the cost of applying erosion and sediment controls to the disturbed area. Replacing vegetation inadvertently destroyed during construction can be extremely expensive, sometimes in excess of $10,000 per tree.

Inspection and Maintenance

During construction, the limits of disturbance should remain clearly marked at all times. Irrigation or maintenance of existing vegetation should be described in the landscaping plan. If damage to protected trees still occurs, maintenance guidelines described below should be followed:

- Verify that protective measures remain in place. Restore damaged protection measures immediately.
- Serious tree injuries shall be attended to by an arborist.
- Damage to the crown, trunk, or root system of a retained tree shall be repaired immediately.
- Trench as far from tree trunks as possible, usually outside of the tree drip line or canopy. Curve trenches around trees to avoid large roots or root concentrations. If roots are encountered, consider tunneling under them. When trenching or tunneling near or under trees to be retained, place tunnels at least 18 in. below the ground surface, and not below the tree center to minimize impact on the roots.
- Do not leave tree roots exposed to air. Cover exposed roots with soil as soon as possible. If soil covering is not practical, protect exposed roots with wet burlap or peat moss until the tunnel or trench is ready for backfill.
- Cleanly remove the ends of damaged roots with a smooth cut.
- Fill trenches and tunnels as soon as possible. Careful filling and tamping will eliminate air spaces in the soil, which can damage roots.
- If bark damage occurs, cut back all loosened bark into the undamaged area, with the cut tapered at the top and bottom and drainage provided at the base of the wood. Limit cutting the undamaged area as much as possible.
- Aerate soil that has been compacted over a trees root zone by punching holes 12 in. deep with an iron bar, and moving the bar back and forth until the soil is loosened. Place holes 18 in. apart throughout the area of compacted soil under the tree crown.
- Fertilization
  - Fertilize stressed or damaged broadleaf trees to aid recovery.
  - Fertilize trees in the late fall or early spring.

- Apply fertilizer to the soil over the feeder roots and in accordance with label instructions, but never closer than 3 ft to the trunk. Increase the fertilized area by one-fourth of the crown area for conifers that have extended root systems.

- Retain protective measures until all other construction activity is complete to avoid damage during site cleanup and stabilization.

References

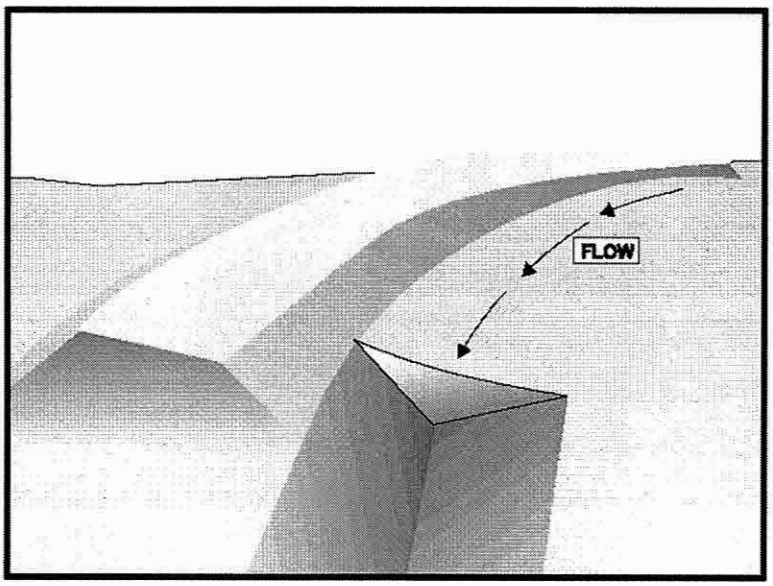
County of Sacramento Tree Preservation Ordinance, September 1981.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Water Quality Management Plan for The Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

Earth Dikes and Drainage Swales EC-9



Objectives

EC	Erosion Control	☑
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ Primary Objective
☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

An earth dike is a temporary berm or ridge of compacted soil used to divert runoff or channel water to a desired location. A drainage swale is a shaped and sloped depression in the soil surface used to convey runoff to a desired location. Earth dikes and drainage swales are used to divert off site runoff around the construction site, divert runoff from stabilized areas and disturbed areas, and direct runoff into sediment basins or traps.

Suitable Applications

Earth dikes and drainage swales are suitable for use, individually or together, where runoff needs to be diverted from one area and conveyed to another.

- Earth dikes and drainage swales may be used:
  - To convey surface runoff down sloping land
  - To intercept and divert runoff to avoid sheet flow over sloped surfaces
  - To divert and direct runoff towards a stabilized watercourse, drainage pipe or channel
  - To intercept runoff from paved surfaces
  - Below steep grades where runoff begins to concentrate
  - Along roadways and facility improvements subject to flood drainage

- At the top of slopes to divert runon from adjacent or undisturbed slopes
- At bottom and mid slope locations to intercept sheet flow and convey concentrated flows
- Divert sediment laden runoff into sediment basins or traps

Limitations

Dikes should not be used for drainage areas greater than 10 acres or along slopes greater than 10 percent. For larger areas more permanent drainage structures should be built. All drainage structures should be built in compliance with local municipal requirements.

- Earth dikes may create more disturbed area on site and become barriers to construction equipment.
- Earth dikes must be stabilized immediately, which adds cost and maintenance concerns.
- Diverted stormwater may cause downstream flood damage.
- Dikes should not be constructed of soils that may be easily eroded.
- Regrading the site to remove the dike may add additional cost.
- Temporary drains and swales or any other diversion of runoff should not adversely impact upstream or downstream properties.
- Temporary drains and swales must conform to local floodplain management requirements.
- Earth dikes/drainage swales are not suitable as sediment trapping devices.
- It may be necessary to use other soil stabilization and sediment controls such as check dams, plastics, and blankets, to prevent scour and erosion in newly graded dikes, swales, and ditches.

Implementation

The temporary earth dike is a berm or ridge of compacted soil, located in such a manner as to divert stormwater to a sediment trapping device or a stabilized outlet, thereby reducing the potential for erosion and offsite sedimentation. Earth dikes can also be used to divert runoff from off site and from undisturbed areas away from disturbed areas and to divert sheet flows away from unprotected slopes.

An earth dike does not itself control erosion or remove sediment from runoff. A dike prevents erosion by directing runoff to an erosion control device such as a sediment trap or directing runoff away from an erodible area. Temporary diversion dikes should not adversely impact adjacent properties and must conform to local floodplain management regulations, and should not be used in areas with slopes steeper than 10%.

Slopes that are formed during cut and fill operations should be protected from erosion by runoff. A combination of a temporary drainage swale and an earth dike at the top of a slope can divert runoff to a location where it can be brought to the bottom of the slope (see EC-11, Slope Drains). A combination dike and swale is easily constructed by a single pass of a bulldozer or grader and

compacted by a second pass of the tracks or wheels over the ridge. Diversion structures should be installed when the site is initially graded and remain in place until post construction BMPs are installed and the slopes are stabilized.

Diversion practices concentrate surface runoff, increasing its velocity and erosive force. Thus, the flow out of the drain or swale must be directed onto a stabilized area or into a grade stabilization structure. If significant erosion will occur, a swale should be stabilized using vegetation, chemical treatment, rock rip-rap, matting, or other physical means of stabilization. Any drain or swale that conveys sediment laden runoff must be diverted into a sediment basin or trap before it is discharged from the site.

General

- Care must be applied to correctly size and locate earth dikes, drainage swales. Excessively steep, unlined dikes, and swales are subject to erosion and gully formation.
- Conveyances should be stabilized.
- Use a lined ditch for high flow velocities.
- Select flow velocity based on careful evaluation of the risks due to erosion of the measure, soil types, overtopping, flow backups, washout, and drainage flow patterns for each project site.
- Compact any fills to prevent unequal settlement.
- Do not divert runoff onto other property without securing written authorization from the property owner.
- When possible, install and utilize permanent dikes, swales, and ditches early in the construction process.
- Provide stabilized outlets.

Earth Dikes

Temporary earth dikes are a practical, inexpensive BMP used to divert stormwater runoff. Temporary diversion dikes should be installed in the following manner:

- All dikes should be compacted by earth moving equipment.
- All dikes should have positive drainage to an outlet.
- All dikes should have 2:1 or flatter side slopes, 18 in. minimum height, and a minimum top width of 24 in. Wide top widths and flat slopes are usually needed at crossings for construction traffic.
- The outlet from the earth dike must function with a minimum of erosion. Runoff should be conveyed to a sediment trapping device such as a Sediment Trap (SE-3) or Sediment Basin (SE-2) when either the dike channel or the drainage area above the dike are not adequately stabilized.

- Temporary stabilization may be achieved using seed and mulching for slopes less than 5% and either rip-rap or sod for slopes in excess of 5%. In either case, stabilization of the earth dike should be completed immediately after construction or prior to the first rain.
- If riprap is used to stabilize the channel formed along the toe of the dike, the following typical specifications apply:

Channel Grade	Riprap Stabilization
0.5-1.0%	4 in. Rock
1.1-2.0%	6 in. Rock
2.1-4.0%	8 in. Rock
4.1-5.0%	8 in. -12 in. Riprap

- The stone riprap, recycled concrete, etc. used for stabilization should be pressed into the soil with construction equipment.
- Filter cloth may be used to cover dikes in use for long periods.
- Construction activity on the earth dike should be kept to a minimum.

Drainage Swales

Drainage swales are only effective if they are properly installed. Swales are more effective than dikes because they tend to be more stable. The combination of a swale with a dike on the downhill side is the most cost effective diversion.

Standard engineering design criteria for small open channel and closed conveyance systems should be used (see the local drainage design manual). Unless local drainage design criteria state otherwise, drainage swales should be designed as follows:

- No more than 5 acres may drain to a temporary drainage swale.
- Place drainage swales above or below, not on, a cut or fill slope.
- Swale bottom width should be at least 2 ft
- Depth of the swale should be at least 18 in.
- Side slopes should be 2:1 or flatter.
- Drainage or swales should be laid at a grade of at least 1 percent, but not more than 15 percent.
- The swale must not be overtopped by the peak discharge from a 10-year storm, irrespective of the design criteria stated above.
- Remove all trees, stumps, obstructions, and other objectionable material from the swale when it is built.
- Compact any fill material along the path of the swale.

- Stabilize all swales immediately. Seed and mulch swales at a slope of less than 5 percent, and use rip-rap or sod for swales with a slope between 5 and 15 percent. For temporary swales, geotextiles and mats (EC-7) may provide immediate stabilization.
- Irrigation may be required to establish sufficient vegetation to prevent erosion.
- Do not operate construction vehicles across a swale unless a stabilized crossing is provided.
- Permanent drainage facilities must be designed by a professional engineer (see the local drainage design criteria for proper design).
- At a minimum, the drainage swale should conform to predevelopment drainage patterns and capacities.
- Construct the drainage swale with a positive grade to a stabilized outlet.
- Provide erosion protection or energy dissipation measures if the flow out of the drainage swale can reach an erosive velocity.

Costs

- Cost ranges from $15 to $55 per ft for both earthwork and stabilization and depends on availability of material, site location, and access.
- Small dikes: $2.50 - $6.50/linear ft; Large dikes: $2.50/yd^3.
- The cost of a drainage swale increases with drainage area and slope. Typical swales for controlling internal erosion are inexpensive, as they are quickly formed during routine earthwork.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspect ditches and berms for washouts. Replace lost riprap, damaged linings or soil stabilizers as needed.
- Inspect channel linings, embankments, and beds of ditches and berms for erosion and accumulation of debris and sediment. Remove debris and sediment and repair linings and embankments as needed.
- Temporary conveyances should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction

References

Erosion and Sediment Control Handbook, S.J. Goldman, K. Jackson, T.A. Bursetynsky, P.E., McGraw Hill Book Company, 1986.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Association of Home Builders (NAHB). Stormwater Runoff & Nonpoint Source Pollution Control Guide for Builders and Developers. National Association of Home Builders, Washington, D.C., 1995

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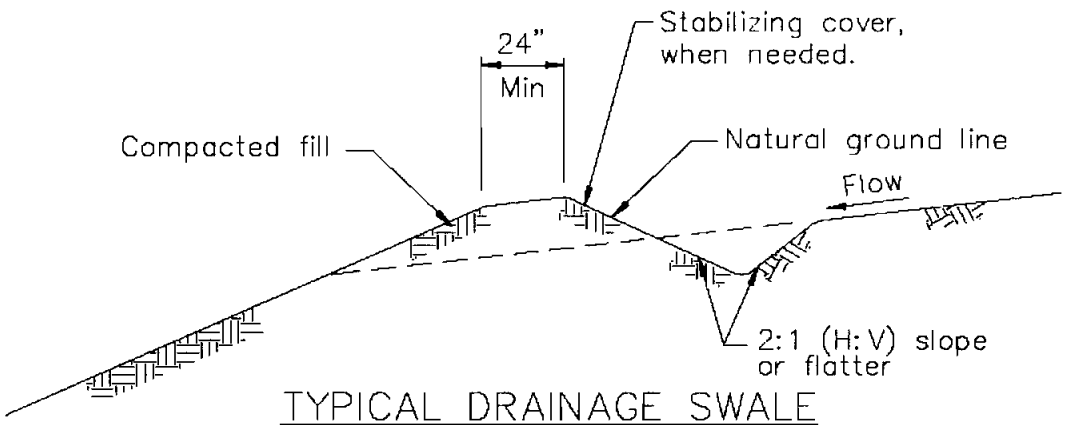
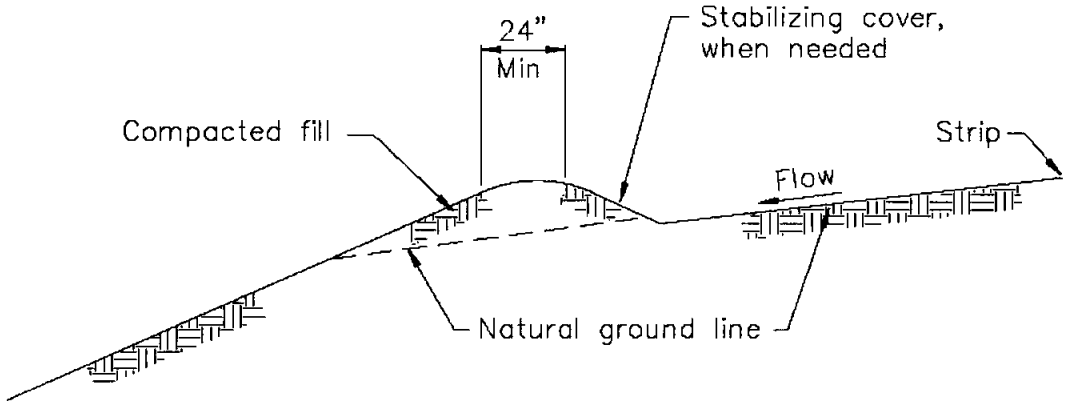


TYPICAL DRAINAGE SWALE
NOT TO SCALE

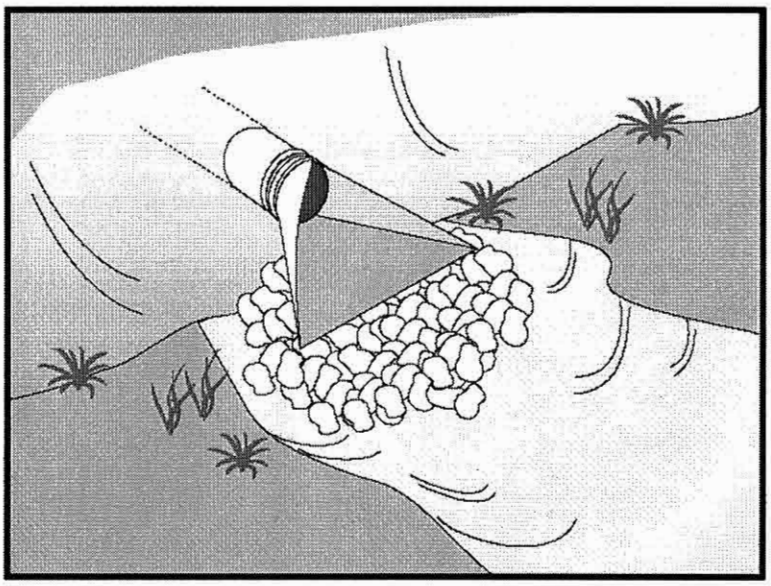
NOTES:

1. Stabilize inlet, outlets and slopes.
2. Properly compact the subgrade.



TYPICAL EARTH DIKE
NOT TO SCALE

Velocity Dissipation Devices EC-10



Objectives

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WE	Wind Erosion Control	
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WM	Waste Management and Materials Pollution Control	

Legend:

☑ Primary Objective

☒ Secondary Objective

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Outlet protection is a physical device composed of rock, grouted riprap, or concrete rubble, which is placed at the outlet of a pipe or channel to prevent scour of the soil caused by concentrated, high velocity flows.

Suitable Applications

Whenever discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach. This includes temporary diversion structures to divert runon during construction.

- These devices may be used at the following locations:
  - Outlets of pipes, drains, culverts, slope drains, diversion ditches, swales, conduits, or channels.
  - Outlets located at the bottom of mild to steep slopes.
  - Discharge outlets that carry continuous flows of water.
  - Outlets subject to short, intense flows of water, such as flash floods.
  - Points where lined conveyances discharge to unlined conveyances

Limitations

- Large storms or high flows can wash away the rock outlet protection and leave the area susceptible to erosion.

- Sediment captured by the rock outlet protection may be difficult to remove without removing the rock.
- Outlet protection may negatively impact the channel habitat.
- Grouted riprap may break up in areas of freeze and thaw.
- If there is not adequate drainage, and water builds up behind grouted riprap, it may cause the grouted riprap to break up due to the resulting hydrostatic pressure.

Implementation

General

Outlet protection is needed where discharge velocities and energies at the outlets of culverts, conduits or channels are sufficient to erode the immediate downstream reach. This practice protects the outlet from developing small eroded pools (plange pools), and protects against gully erosion resulting from scouring at a culvert mouth.

Design and Layout

As with most channel design projects, depth of flow, roughness, gradient, side slopes, discharge rate, and velocity should be considered in the outlet design. Compliance to local and state regulations should also be considered while working in environmentally sensitive streambeds. General recommendations for rock size and length of outlet protection mat are shown in the rock outlet protection figure in this BMP and should be considered minimums. The apron length and rock size gradation are determined using a combination of the discharge pipe diameter and estimate discharge rate: Select the longest apron length and largest rock size suggested by the pipe size and discharge rate. Where flows are conveyed in open channels such as ditches and swales, use the estimated discharge rate for selecting the apron length and rock size. Flows should be same as the culvert or channel design flow but never the less than the peak 5 year flow for temporary structures planned for one rainy season, or the 10 year peak flow for temporary structures planned for two or three rainy seasons.

- There are many types of energy dissipaters, with rock being the one that is represented in the attached figure.
- Best results are obtained when sound, durable, and angular rock is used.
- Install riprap, grouted riprap, or concrete apron at selected outlet. Riprap aprons are best suited for temporary use during construction. Grouted or wired tied rock riprap can minimize maintenance requirements.
- Rock outlet protection is usually less expensive and easier to install than concrete aprons or energy dissipaters. It also serves to trap sediment and reduce flow velocities.
- Carefully place riprap to avoid damaging the filter fabric.
    - Stone 4 in. to 6 in. may be carefully dumped onto filter fabric from a height not to exceed 12 in.
    - Stone 8 in. to 12 in. must be hand placed onto filter fabric, or the filter fabric may be covered with 4 in. of gravel and the 8 in. to 12 in. rock may be dumped from a height not to exceed 16 in.

- Stone greater than 12 in. shall only be dumped onto filter fabric protected with a layer of gravel with a thickness equal to one half the D_{50} rock size, and the dump height limited to twice the depth of the gravel protection layer thickness.

- For proper operation of apron: Align apron with receiving stream and keep straight throughout its length. If a curve is needed to fit site conditions, place it in upper section of apron.

- Outlets on slopes steeper than 10 percent should have additional protection.

Costs

Costs are low if material is readily available. If material is imported, costs will be higher. Average installed cost is $150 per device.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.

- Inspect BMPs subjected to non-stormwater discharges daily while non-stormwater discharges occur.

- Inspect apron for displacement of the riprap and damage to the underlying fabric. Repair fabric and replace riprap that has washed away. If riprap continues to wash away, consider using larger material.

- Inspect for scour beneath the riprap and around the outlet. Repair damage to slopes or underlying filter fabric immediately.

- Temporary devices should be completely removed as soon as the surrounding drainage area has been stabilized or at the completion of construction.

References

County of Sacramento Improvement Standards, Sacramento County, May 1989.

Erosion and Sediment Control Handbook, S.J. Goldman, K. Jackson, T.A. Bursztynsky, P.E., McGraw Hill Book Company, 1986.

Handbook of Steel Drainage & Highway Construction, American Iron and Steel Institute, 1983.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

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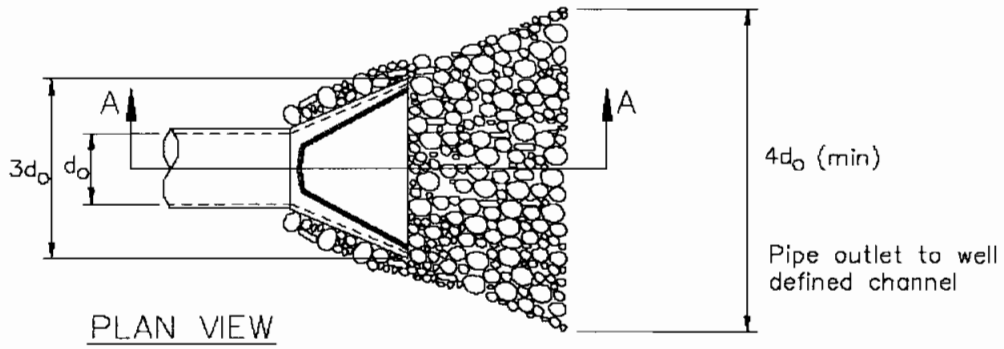
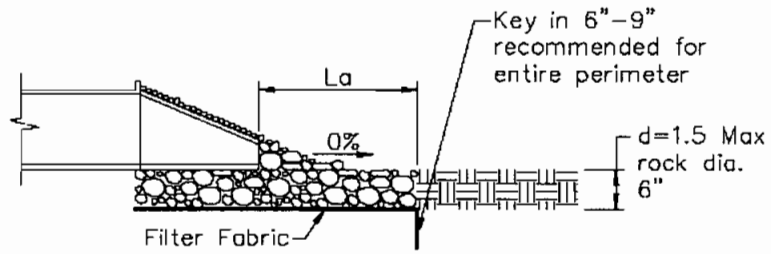


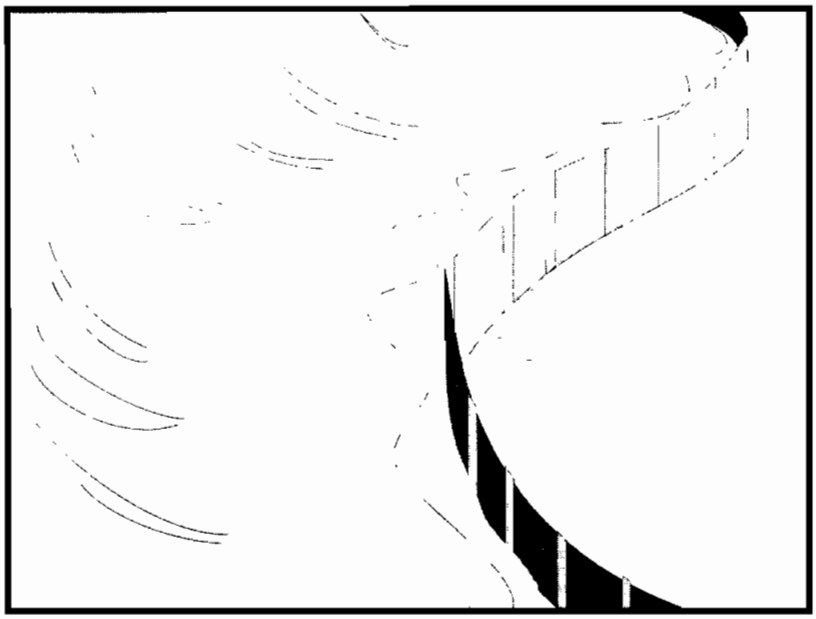


SECTION A–A

Pipe Diameter inches	Discharge ft^3/s	Apron Length, La ft	Rip Rap D_{50} Diameter Min inches
12	5	10	4
	10	13	6
18	10	10	6
	20	16	8
	30	23	12
	40	26	16
24	30	16	8
	40	26	8
	50	26	12
	60	30	16

For larger or higher flows consult a Registered Civil Engineer
Source: USDA - SCS

Silt Fence SE-1



Objectives

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Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-9 Straw Bale Barrier

Description and Purpose

A silt fence is made of a filter fabric that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They should also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion. Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls. Suitable applications include:

- Along the perimeter of a project.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Below other small cleared areas.

Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.

- Do not use in locations where ponded water may cause flooding.
- Do not place fence on a slope, or across any contour line. If not installed at the same elevation throughout, silt fences will create erosion.
- Filter fences will create a temporary sedimentation pond on the upstream side of the fence and may cause temporary flooding. Fences not constructed on a level contour will be overtopped by concentrated flow resulting in failure of the filter fence.
- Improperly installed fences are subject to failure from undercutting, overlapping, or collapsing.
  - Not effective unless trenched and keyed in.
  - Not intended for use as mid-slope protection on slopes greater than 4:1 (H:V).
  - Do not allow water depth to exceed 1.5 ft at any point.

Implementation

General

A silt fence is a temporary sediment barrier consisting of filter fabric stretched across and attached to supporting posts, entrenched, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap sediment by intercepting and detaining small amounts of sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

Silt fences are preferable to straw bale barriers in many cases. Laboratory work at the Virginia Highway and Transportation Research Council has shown that silt fences can trap a much higher percentage of suspended sediments than can straw bales. While the failure rate of silt fences is lower than that of straw bale barriers, there are many instances where silt fences have been improperly installed. The following layout and installation guidance can improve performance and should be followed:

- Use principally in areas where sheet flow occurs.
- Don't use in streams, channels, or anywhere flow is concentrated. Don't use silt fences to divert flow.
- Don't use below slopes subject to creep, slumping, or landslides.
- Select filter fabric that retains 85% of soil by weight, based on sieve analysis, but that is not finer than an equivalent opening size of 70.
- Install along a level contour, so water does not pond more than 1.5 ft at any point along the silt fence.
- The maximum length of slope draining to any point along the silt fence should be 200 ft or less.
- The maximum slope perpendicular to the fence line should be 1:1.

- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft^2 of ponding area should be provided for every acre draining to the fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.
- Silt fences should remain in place until the disturbed area is permanently stabilized.

Design and Layout

Selection of a filter fabric is based on soil conditions at the construction site (which affect the equivalent opening size (EOS) fabric specification) and characteristics of the support fence (which affect the choice of tensile strength). The designer should specify a filter fabric that retains the soil found on the construction site yet that it has openings large enough to permit drainage and prevent clogging. The following criteria is recommended for selection of the equivalent opening size:

1. If 50 percent or less of the soil, by weight, will pass the U.S. Standard Sieve No. 200, select the EOS to retain 85 % of the soil. The EOS should not be finer than EOS 70.
2. For all other soil types, the EOS should be no larger than the openings in the U.S. Standard Sieve No. 70 except where direct discharge to a stream, lake, or wetland will occur, then the EOS should be no larger than Standard Sieve No. 100.

To reduce the chance of clogging, it is preferable to specify a fabric with openings as large as allowed by the criteria. No fabric should be specified with an EOS smaller than U.S. Standard Sieve No. 100. If 85% or more of a soil, by weight, passes through the openings in a No. 200 sieve, filter fabric should not be used. Most of the particles in such a soil would not be retained if the EOS was too large and they would clog the fabric quickly if the EOS were small enough to capture the soil.

The fence should be supported by a plastic or wire mesh if the fabric selected does not have sufficient strength and bursting strength characteristics for the planned application (as recommended by the fabric manufacturer). Filter fabric material should contain ultraviolet inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 °F to 120 °F.

- Layout in accordance with attached figures.
- For slopes steeper than 2:1 (H:V) and that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to install additional protection immediately adjacent to the bottom of the slope, prior to installing silt fence. Additional protection may be a chain link fence or a cable fence.
- For slopes adjacent to sensitive receiving waters or Environmentally Sensitive Areas (ESAs), silt fence should be used in conjunction with erosion control BMPs.

Materials

- Silt fence fabric should be woven polypropylene with a minimum width of 36 in. and a minimum tensile strength of 100 lb force. The fabric should conform to the requirements in ASTM designation D4632 and should have an integral reinforcement layer. The reinforcement layer should be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric should be between 0.1 sec^{-1} and 0.15 sec^{-1} in conformance with the requirements in ASTM designation D4491.

- Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15 gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.

- There are new products that may use prefabricated plastic holders for the silt fence and use bar reinforcement instead of wood stakes. If bar reinforcement is used in lieu of wood stakes, use number four or greater bar. Provide end protection for any exposed bar reinforcement.

Installation Guidelines

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line the proposed silt fence.

- Bottom of the silt fence should be keyed-in a minimum of 12 in.

- Posts should be spaced a maximum of 6 ft apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.

- When standard strength filter fabric is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy–duty wire staples at least 1 in. long. The mesh should extend into the trench. When extra-strength filter fabric and closer post spacing are used, the mesh support fence may be eliminated. Filter fabric should be purchased in a long roll, and then cut to the length of the barrier. When joints are necessary, filter cloth should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.

- The trench should be backfilled with compacted native material.

- Construct silt fences with a setback of at least 3 ft from the toe of a slope. Where a silt fence is determined to be not practicable due to specific site conditions, the silt fence may be constructed at the toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences close to the toe of the slope will be less effective and difficult to maintain.

- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.

Costs

- Average annual cost for installation and maintenance (assumes 6 month useful life): $7 per lineal foot ($850 per drainage acre). Range of cost is $3.50 - $9.10 per lineal foot.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Repair undercut silt fences.
- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed of, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Silt fences should be left in place until the upstream area is permanently stabilized. Until then, the silt fence must be inspected and maintained.
- Holes, depressions, or other ground disturbance caused by the removal of the silt fences should be backfilled and repaired.

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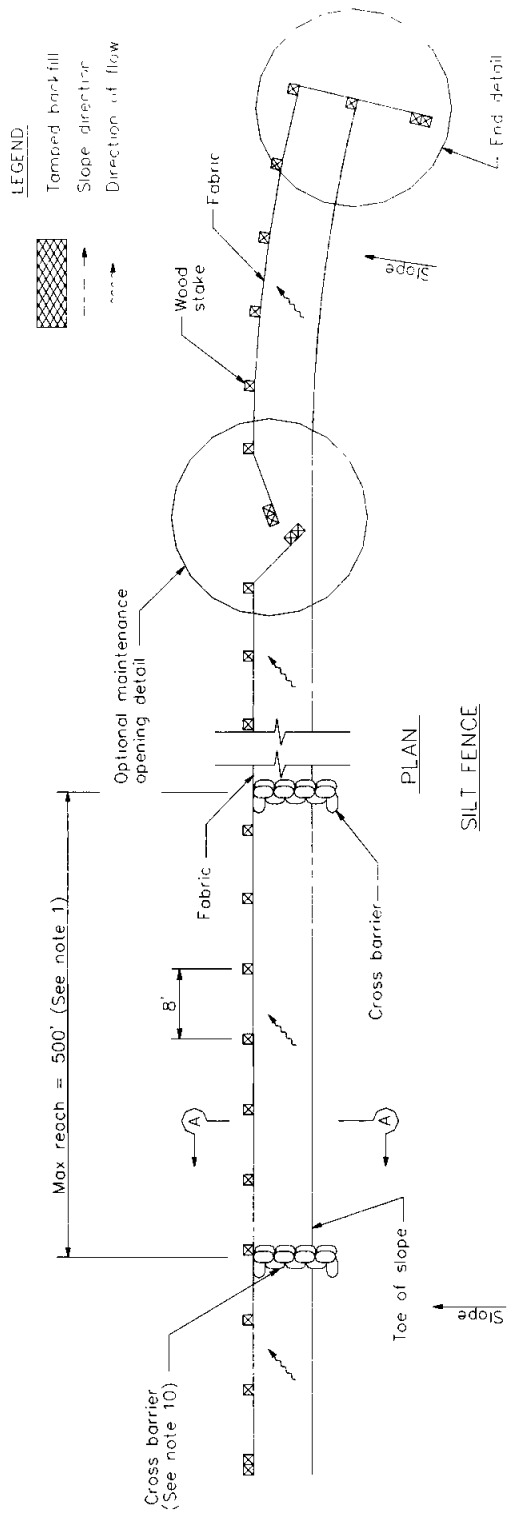
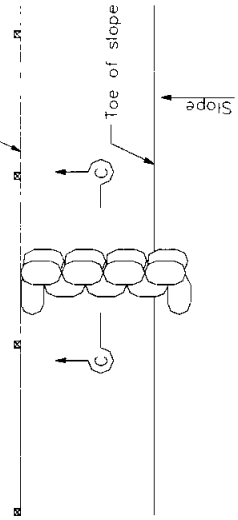
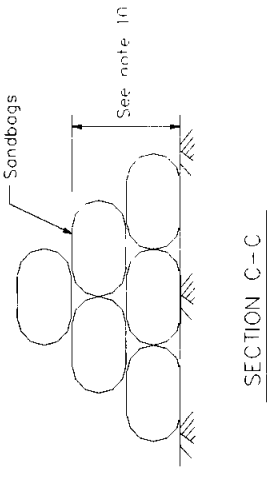
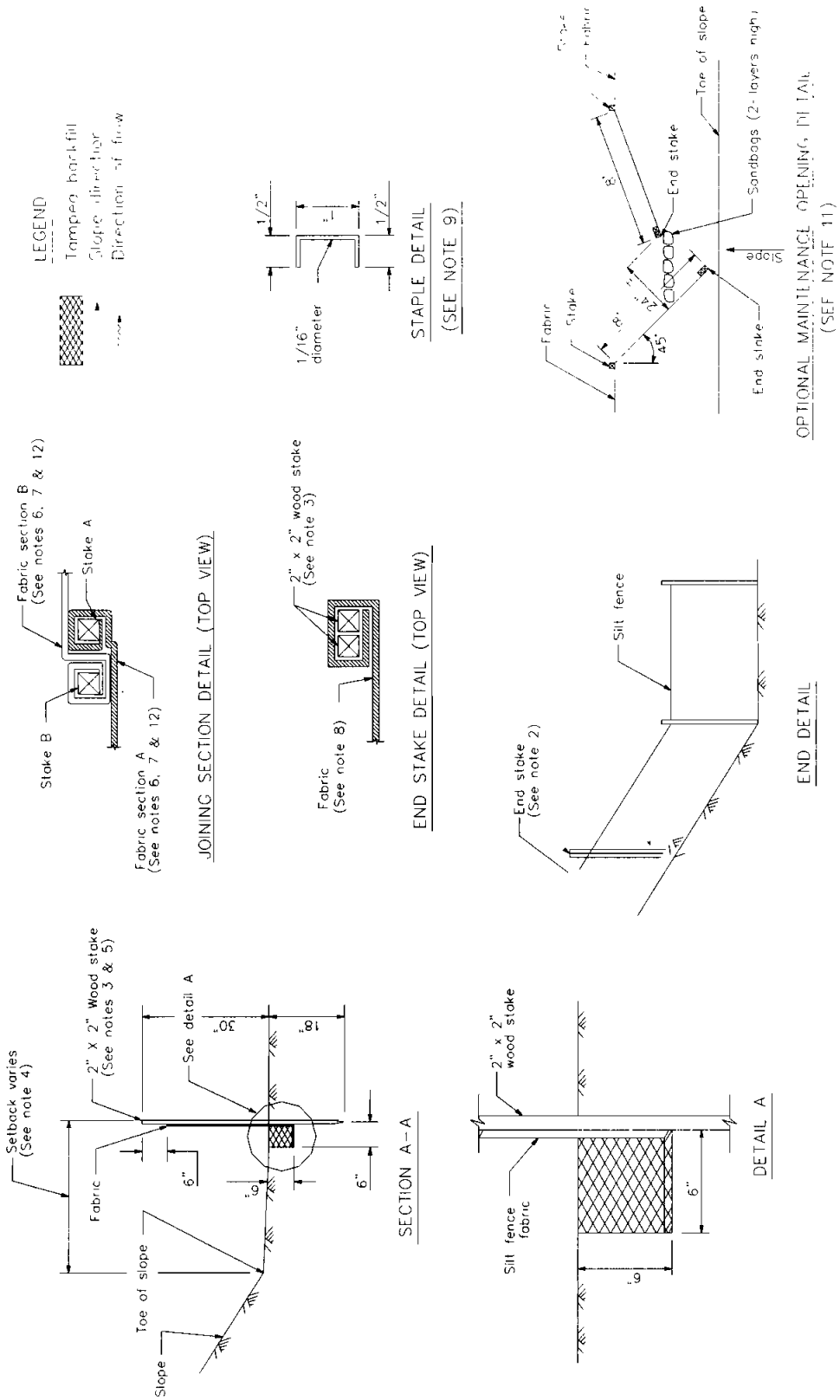




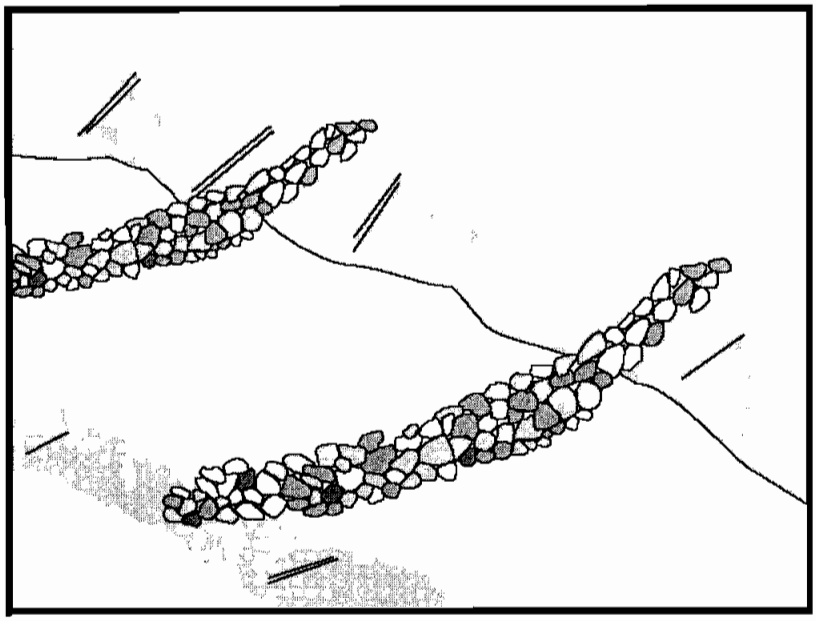


NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier, in no case shall the reach length exceed 500'
2. The last 8'-0" of fence shall be turned up slope
3. Stake dimensions are nominal
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'-0" maximum and shall be positioned on downstream side of fence
6. Stakes to overlap and fence fabric to fold around each stake one full turn Secure fabric to stake with 4 staples
7. Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire
8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples
9. Minimum 4 staples per stake. Dimensions shown are typical
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.


LEGEND
Tamped backfill
Slope direction
Direction of flow
1/2"
1/16" diameter
1/2"
STAPLE DETAIL
(SEE NOTE 9)
Fabric section B
(See notes 6, 7 & 12)
Stake A
Stake B
Fabric section A
(See notes 6, 7 & 12)
JOINING SECTION DETAIL (TOP VIEW)
2" x 2" wood stake
(See note 3)
Fabric
(See note 8)
END STAKE DETAIL (TOP VIEW)
Fabric
Stake
45°
End stake
Sandbags (2-layers high)
Top of slope
Slope
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)
Silt fence
End stake
(See note 2)
END DETAIL
Setback varies
(See note 4)
2" X 2" Wood stake
(See notes 3 & 5)
See detail A
30"
18"
Fabric
6"
6"
6"
Toe of slope
Slope
SECTION A-A
2" x 2"
wood stake
Silt fence
fabric
6"
6"
DETAIL A

Check Dams SE-4



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

Description and Purpose

A check dam is a small barrier constructed of rock, gravel bags, sandbags, fiber rolls, or reusable products, placed across a constructed swale or drainage ditch. Check dams reduce the effective slope of the channel, thereby reducing the velocity of flowing water, allowing sediment to settle and reducing erosion.

Suitable Applications

Check dams may be appropriate in the following situations:

- To promote sedimentation behind the dam.
- To prevent erosion by reducing the velocity of channel flow in small intermittent channels and temporary swales.
- In small open channels that drain 10 acres or less.
- In steep channels where stormwater runoff velocities exceed 5 ft/s.
- During the establishment of grass linings in drainage ditches or channels.
- In temporary ditches where the short length of service does not warrant establishment of erosion-resistant linings.

Limitations

- Not to be used in live streams or in channels with extended base flows.

- Not appropriate in channels that drain areas greater than 10 acres.
- Not appropriate in channels that are already grass-lined unless erosion is expected, as installation may damage vegetation.
- Require extensive maintenance following high velocity flows.
- Promotes sediment trapping which can be re-suspended during subsequent storms or removal of the check dam.

Implementation

General

Check dams reduce the effective slope and create small pools in swales and ditches that drain 10 acres or less. Reduced slopes reduce the velocity of stormwater flows, thus reducing erosion of the swale or ditch and promoting sedimentation. Use of check dams for sedimentation will likely result in little net removal of sediment because of the small detention time and probable scour during longer storms. Using a series of check dams will generally increase their effectiveness. A sediment trap (SE-3) may be placed immediately upstream of the check dam to increase sediment removal efficiency.

Design and Layout

Check dams work by decreasing the effective slope in ditches and swales. An important consequence of the reduced slope is a reduction in capacity of the ditch or swale. This reduction in capacity must be considered when using this BMP, as reduced capacity can result in overtopping of the ditch or swale and resultant consequences. In some cases, such as a "permanent" ditch or swale being constructed early and used as a "temporary" conveyance for construction flows, the ditch or swale may have sufficient capacity such that the temporary reduction in capacity due to check dams is acceptable. When check dams reduce capacities beyond acceptable limits, there are several options:

- Don't use check dams. Consider alternative BMPs.
- Increase the size of the ditch or swale to restore capacity.

Maximum slope and velocity reduction is achieved when the toe of the upstream dam is at the same elevation as the top of the downstream dam. The center section of the dam should be lower than the edge sections so that the check dam will direct flows to the center of the ditch or swale.

Check dams are usually constructed of rock, gravel bags, sandbags, and fiber rolls. A number of products manufactured specifically for use as check dams are also being used, and some of these products can be removed and reused. Check dams can also be constructed of logs or lumber, and have the advantage of a longer lifespan when compared to gravel bags, sandbags, and fiber rolls. Straw bales can also be used for check dams and can work if correctly installed; but in practice, straw bale check dams have a high failure rate. Check dams should not be constructed from straw bales or silt fences, since concentrated flows quickly wash out these materials.

Rock check dams are usually constructed of 8 to 12 in. rock. The rock is placed either by hand or mechanically, but never just dumped into the channel. The dam must completely span the ditch

or swale to prevent washout. The rock used must be large enough to stay in place given the expected design flow through the channel.

Log check dams are usually constructed of 4 to 6 in. diameter logs. The logs should be embedded into the soil at least 18 in. Logs can be bolted or wired to vertical support logs that have been driven or buried into the soil.

Gravel bag and sandbag check dams are constructed by stacking bags across the ditch or swale, shaped as shown in the drawings at the end of this fact sheet.

Manufactured products should be installed in accordance with the manufacturer's instructions.

If grass is planted to stabilize the ditch or swale, the check dam should be removed when the grass has matured (unless the slope of the swales is greater than 4%).

The following guidance should be followed for the design and layout of check dams:

- Install the first check dam approximately 16 ft from the outfall device and at regular intervals based on slope gradient and soil type.
- Check dams should be placed at a distance and height to allow small pools to form between each check dam.
- Backwater from a downstream check dam should reach the toes of the upstream check dam.
- A sediment trap provided immediately upstream of the check dam will help capture sediment. Due to the potential for this sediment to be resuspended in subsequent storms, the sediment trap must be cleaned following each storm event.
- High flows (typically a 2-year storm or larger) should safely flow over the check dam without an increase in upstream flooding or damage to the check dam.
- Where grass is used to line ditches, check dams should be removed when grass has matured sufficiently to protect the ditch or swale.
- Gravel bags may be used as check dams with the following specifications:

Materials

Gravel bags used for check dams should conform to the requirements of SE-6, Gravel Bag Berms. Sandbags used for check dams should conform to SE-8, Sandbag Barrier. Fiber rolls used for check dams should conform to SE-5, Fiber Rolls. Straw bales used for check dams should conform to SE-9, Straw Bale Barrier.

Installation

- Rock should be placed individually by hand or by mechanical methods (no dumping of rock) to achieve complete ditch or swale coverage.
- Tightly abut bags and stack according to detail shown in the figure at the end of this section. Gravel bags and sandbags should not be stacked any higher than 3 ft.
- Fiber rolls and straw bales must be trenched in and firmly staked in place.

Costs

Cost consists of only installation costs if materials are readily available. If material must be imported, costs may increase. For material costs, see SE-5, SE-6, SE-8 and SE-9.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Replace missing rock, bags, bales, etc. Replace bags or bales that have degraded or have become damaged.
- If the check dam is used as a sediment capture device, sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- If the check dam is used as a grade control structure, sediment removal is not required as long as the system continues to control the grade.
- Remove accumulated sediment prior to permanent seeding or soil stabilization.
- Remove check dam and accumulated sediment when check dams are no longer needed.

References

Draft – Sedimentation and Erosion Control, and Inventory of Current Practices, USEPA, April 1990.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

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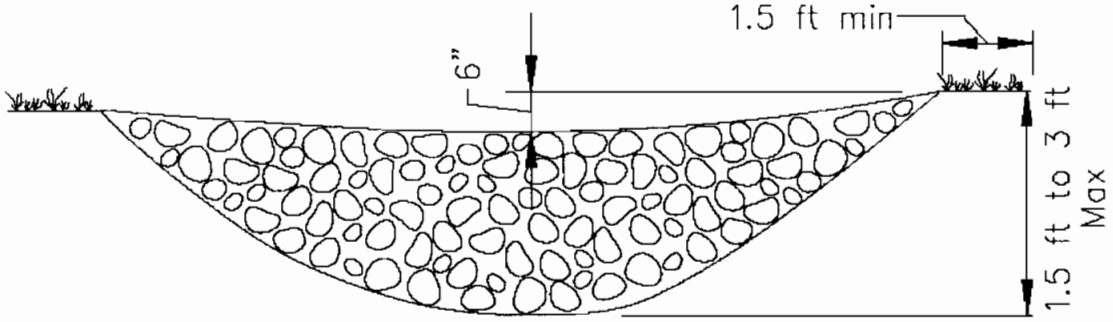
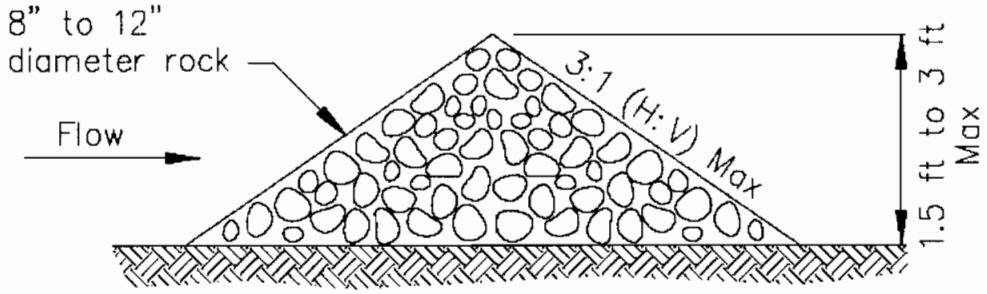
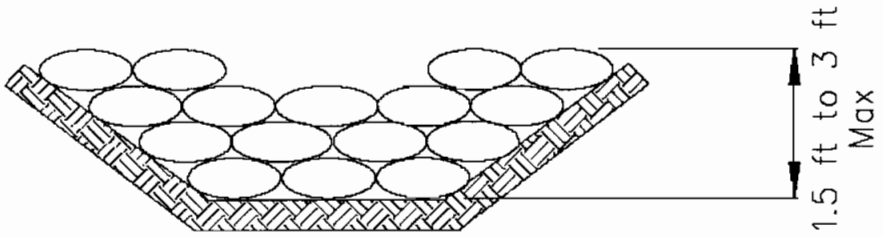


ELEVATION



TYPICAL ROCK CHECK DAM SECTION

ROCK CHECK DAM
NOT TO SCALE



GRAVEL BAG CHECK DAM ELEVATION
NOT TO SCALE

Street Sweeping and Vacuuming SE-7

Objectives		
EC	Erosion Control	
SE	Sediment Control	☒
TR	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

Limitations

Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.

- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.
- If not mixed with debris or trash, consider incorporating the removed sediment back into the project

Costs

Rental rates for self-propelled sweepers vary depending on hopper size and duration of rental. Expect rental rates from $58/hour (3 yd^3 hopper) to $88/hour (9 yd^3 hopper), plus operator costs. Hourly production rates vary with the amount of area to be swept and amount of sediment. Match the hopper size to the area and expect sediment load to minimize time spent dumping.

Inspection and Maintenance

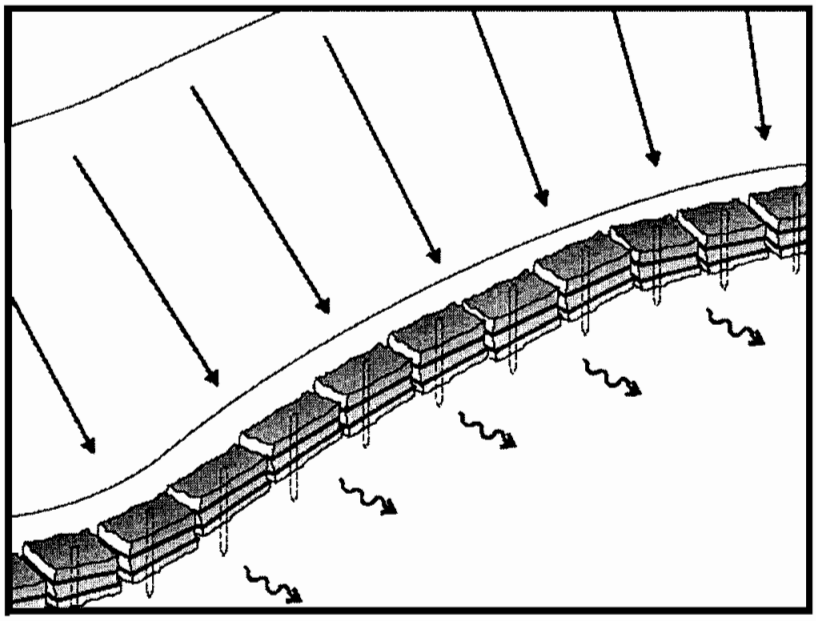
- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- When actively in use, points of ingress and egress must be inspected daily.
- When tracked or spilled sediment is observed outside the construction limits, it must be removed at least daily. More frequent removal, even continuous removal, may be required in some jurisdictions.
- Be careful not to sweep up any unknown substance or any object that may be potentially hazardous.
- Adjust brooms frequently; maximize efficiency of sweeping operations.
- After sweeping is finished, properly dispose of sweeper wastes at an approved dumpsite.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Labor Surcharge and Equipment Rental Rates, State of California Department of Transportation (Caltrans), April 1, 2002 – March 31, 2003.

Straw Bale Barrier SE-9



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☑
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

Description and Purpose

A straw bale barrier is a series of straw bales placed on a level contour to intercept sheet flows. Straw bale barriers pond sheet- flow runoff, allowing sediment to settle out.

Suitable Applications

Straw bale barriers may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow

- At the top of slopes to divert runoff away from disturbed slopes
- As check dams across mildly sloped construction roads

Limitations

Straw bale barriers:

- Are not to be used for extended periods of time because they tend to rot and fall apart
- Are suitable only for sheet flow on slopes of 10 % or flatter
- Are not appropriate for large drainage areas, limit to one acre or less
- May require constant maintenance due to rotting
- Are not recommended for concentrated flow, inlet protection, channel flow, and live streams
- Cannot be made of bale bindings of jute or cotton
- Require labor-intensive installation and maintenance
- Cannot be used on paved surfaces
- Should not to be used for drain inlet protection
- Should not be used on lined ditches
- May introduce undesirable non-native plants to the area

Implementation

General

A straw bale barrier consists of a row of straw bales placed on a level contour. When appropriately placed, a straw bale barrier intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding provides quiescent conditions allowing sediment to settle. Straw bale barriers also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets, which erode rills, and ultimately gullies, into disturbed, sloped soils.

Straw bale barriers have not been as effective as expected due to improper use. These barriers have been placed in streams and drainage ways where runoff volumes and velocities have caused the barriers to wash out. In addition, failure to stake and entrench the straw bale has allowed undercutting and end flow. Use of straw bale barriers in accordance with this BMP should produce acceptable results.

Design and Layout

- Locate straw bale barriers on a level contour.
  - Slopes up to 10:1 (H:V): Straw bales should be placed at a maximum interval of 50 ft (a closer spacing is more effective), with the first row near the toe of slope.
  - Slopes greater than 10:1 (H:V): Not recommended.

- Turn the ends of the straw bale barrier up slope to prevent runoff from going around the barrier.
- Allow sufficient space up slope from the barrier to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, consider moving the barrier away from the slope toe to facilitate cleaning. To prevent flow behind the barrier, sand bags can be placed perpendicular to the barrier to serve as cross barriers.
- Drainage area should not exceed 1 acre, or 0.25 acre per 100 ft of barrier.
- Maximum flow path to the barrier should be limited to 100 ft.
- Straw bale barriers should consist of two parallel rows.
  - Butt ends of bales tightly
  - Stagger butt joints between front and back row
  - Each row of bales must be trenched in and firmly staked
- Straw bale barriers are limited in height to one bale laid on its side.
- Anchor bales with either two wood stakes or four bars driven through the bale and into the soil. Drive the first stake towards the butt joint with the adjacent bale to force the bales together.
- See attached figure for installation details.

Materials

- ***Straw Bale Size:*** Each straw bale should be a minimum of 14 in. wide, 18 in. in height, 36 in. in length and should have a minimum mass of 50 lbs. The straw bale should be composed entirely of vegetative matter, except for the binding material.
- ***Bale Bindings:*** Bales should be bound by steel wire, nylon or polypropylene string placed horizontally. Jute and cotton binding should not be used. Baling wire should be a minimum diameter of 14 gauge. Nylon or polypropylene string should be approximately 12 gauge in diameter with a breaking strength of 80 lbs force.
- ***Stakes:*** Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable. Steel bar reinforcement should be equal to a #4 designation or greater. End protection should be provided for any exposed bar reinforcement.

Costs

Straw bales cost $5 - $7 each. Adequate labor should be budgeted for installation and maintenance.

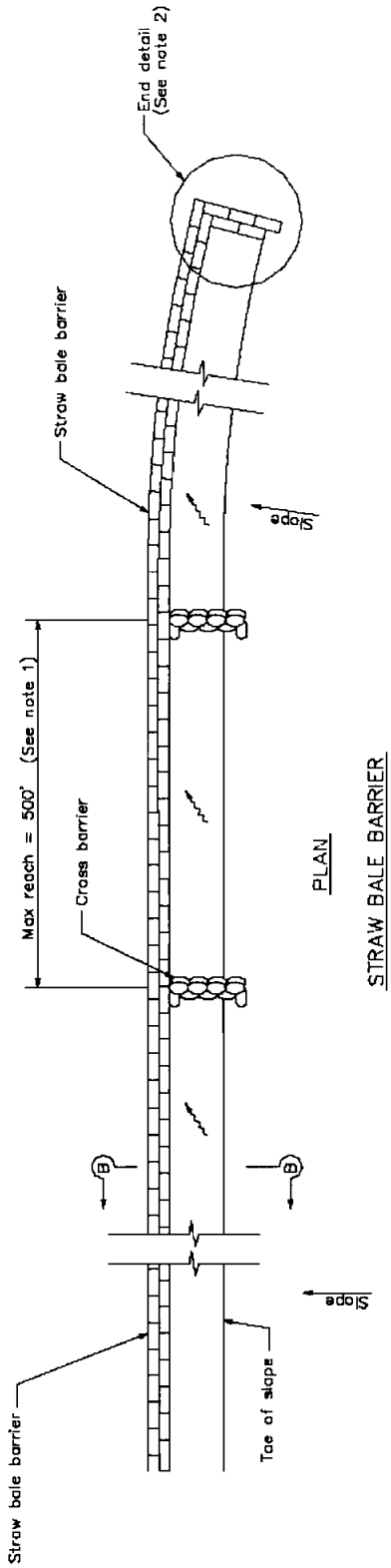
Inspection and Maintenance

Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Straw bales degrade, especially when exposed to moisture. Rotting bales will need to be replaced on a regular basis.
- Replace or repair damaged bales as needed.
- Repair washouts or other damages as needed.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Remove straw bales when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area. Removed sediment should be incorporated in the project or disposed of.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.



PLAN

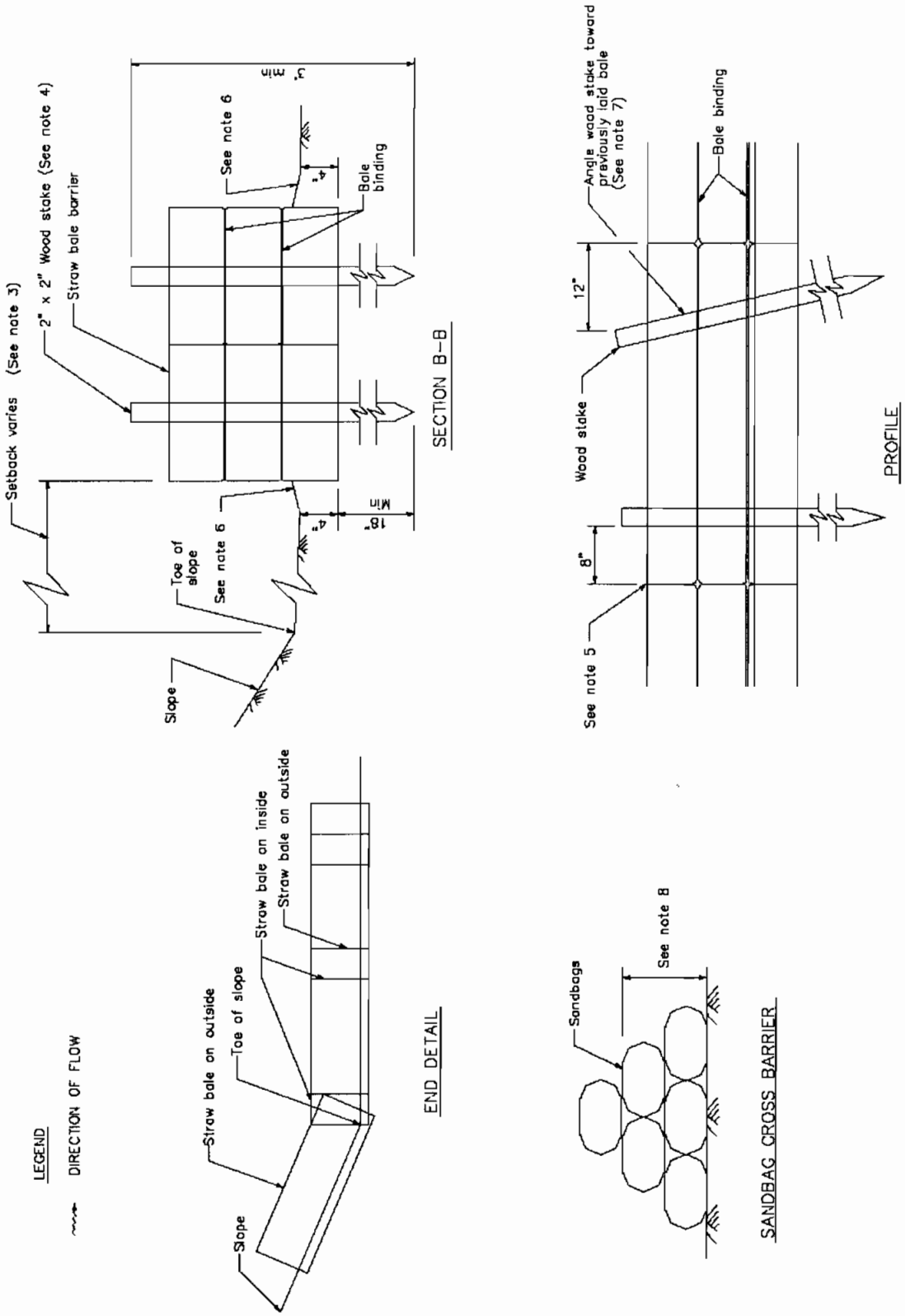
STRAW BALE BARRIER

LEGEND

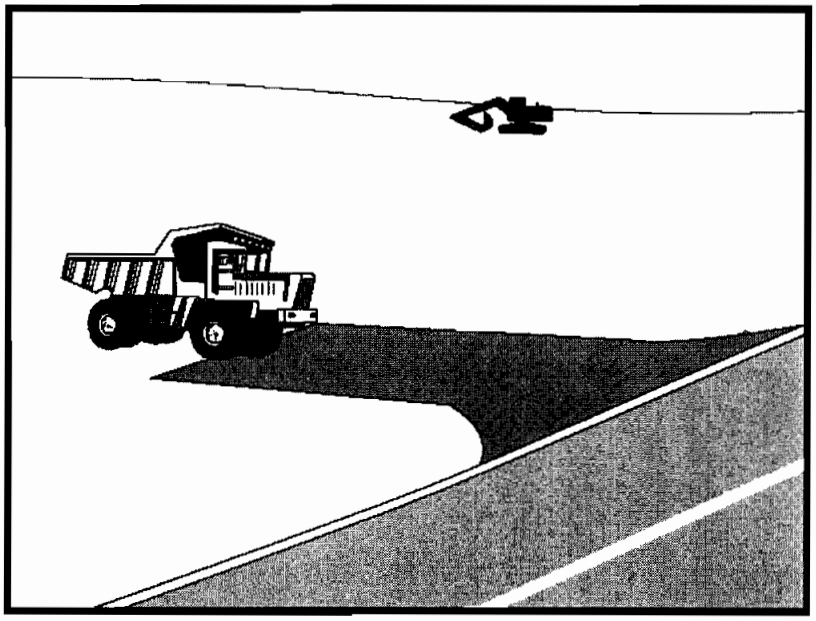
DIRECTION OF FLOW

NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier. In no case shall the reach length exceed 500'.
2. The end of barrier shall be turned up slope.
3. Dimension may vary to fit field condition.
4. Stake dimensions are nominal.
5. Place straw bales tightly together.
6. Tamp embedment spoils against sides of installed bales.
7. Drive angled wood stake before vertical stake to ensure tight abutment to adjacent bale.
8. Sandbag cross barriers should be a min of 1/2 and a max of 2/3 the height of the linear barrier.
9. Sandbag rows and layers should be offset to eliminate gaps.


Setback varies (See note 3)
2" x 2" Wood stake (See note 4)
Straw bale barrier
Toe of slope
See note 6
Slope
See note 6
Bale binding
4"
5' Min
18" Min
4"
SECTION B-B
Angle wood stake toward previously laid bale (See note 7)
Bale binding
12"
Wood stake
8"
See note 5
PROFILE
LEGEND
DIRECTION OF FLOW
Straw bale on outside
Toe of slope
Straw bale on inside
Straw bale on outside
Slope
END DETAIL
Sandbags
See note 8
SANDBAG CROSS BARRIER

Stabilized Construction Entrance/Exit TC-1



Objectives

EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water runoff.

Implementation

General

A stabilized construction entrance is a pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto public rights of way or streets. Reducing tracking of sediments and other pollutants onto paved roads helps prevent deposition of sediments into local storm drains and production of airborne dust.

Where traffic will be entering or leaving the construction site, a stabilized construction entrance should be used. NPDES permits require that appropriate measures be implemented to prevent tracking of sediments onto paved roadways, where a significant source of sediments is derived from mud and dirt carried out from unpaved roads and construction sites.

Stabilized construction entrances are moderately effective in removing sediment from equipment leaving a construction site. The entrance should be built on level ground. Advantages of the Stabilized Construction Entrance/Exit is that it does remove some sediment from equipment and serves to channel construction traffic in and out of the site at specified locations. Efficiency is greatly increased when a washing rack is included as part of a stabilized construction entrance/exit.

Design and Layout

- Construct on level ground where possible.
- Select 3 to 6 in. diameter stones.
- Use minimum depth of stones of 12 in. or as recommended by soils engineer.
- Construct length of 50 ft minimum, and 30 ft minimum width.
- Rumble racks constructed of steel panels with ridges and installed in the stabilized entrance/exit will help remove additional sediment and to keep adjacent streets clean.
- Provide ample turning radii as part of the entrance.
- Limit the points of entrance/exit to the construction site.
- Limit speed of vehicles to control dust.
- Properly grade each construction entrance/exit to prevent runoff from leaving the construction site.
- Route runoff from stabilized entrances/exits through a sediment trapping device before discharge.
- Design stabilized entrance/exit to support heaviest vehicles and equipment that will use it.
- Select construction access stabilization (aggregate, asphaltic concrete, concrete) based on longevity, required performance, and site conditions. Do not use asphalt concrete (AC) grindings for stabilized construction access/roadway.

- If aggregate is selected, place crushed aggregate over geotextile fabric to at least 12 in. depth, or place aggregate to a depth recommended by a geotechnical engineer. A crushed aggregate greater than 3 in. but smaller than 6 in. should be used.
- Designate combination or single purpose entrances and exits to the construction site.
- Require that all employees, subcontractors, and suppliers utilize the stabilized construction access.
- Implement SE-7, Street Sweeping and Vacuuming, as needed.
- All exit locations intended to be used for more than a two-week period should have stabilized construction entrance/exit BMPs.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMPs are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect local roads adjacent to the site daily. Sweep or vacuum to remove visible accumulated sediment.
- Remove aggregate, separate and dispose of sediment if construction entrance/exit is clogged with sediment.
- Keep all temporary roadway ditches clear.
- Check for damage and repair as needed.
- Replace gravel material when surface voids are visible.
- Remove all sediment deposited on paved roadways within 24 hours.
- Remove gravel and filter fabric at completion of construction

Costs

Average annual cost for installation and maintenance may vary from $1,200 to $4,800 each, averaging $2,400 per entrance. Costs will increase with addition of washing rack, and sediment trap. With wash rack, costs range from $1,200 - $6,000 each, averaging $3,600 per entrance.

References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, USEPA Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April 1992.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

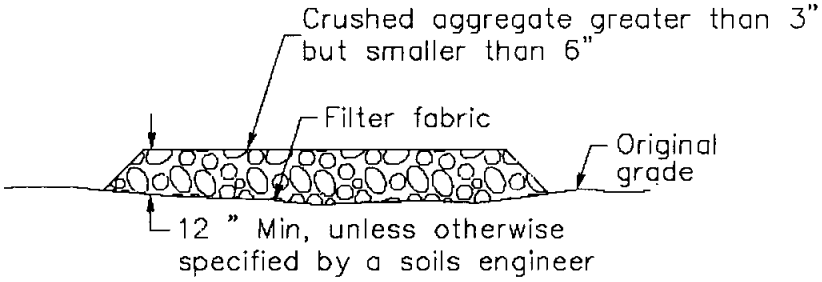
Stormwater Management of the Puget Sound Basin, Technical Manual, Publication #91-75, Washington State Department of Ecology, February 1992.

Virginia Erosion and Sedimentation Control Handbook, Virginia Department of Conservation and Recreation, Division of Soil and Water Conservation, 1991.

Guidance Specifying Management Measures for Nonpoint Pollution in Coastal Waters, EPA 840-B-9-002, USEPA, Office of Water, Washington, DC, 1993.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

Stabilized Construction Entrance/Exit TC-1



SECTION B–B
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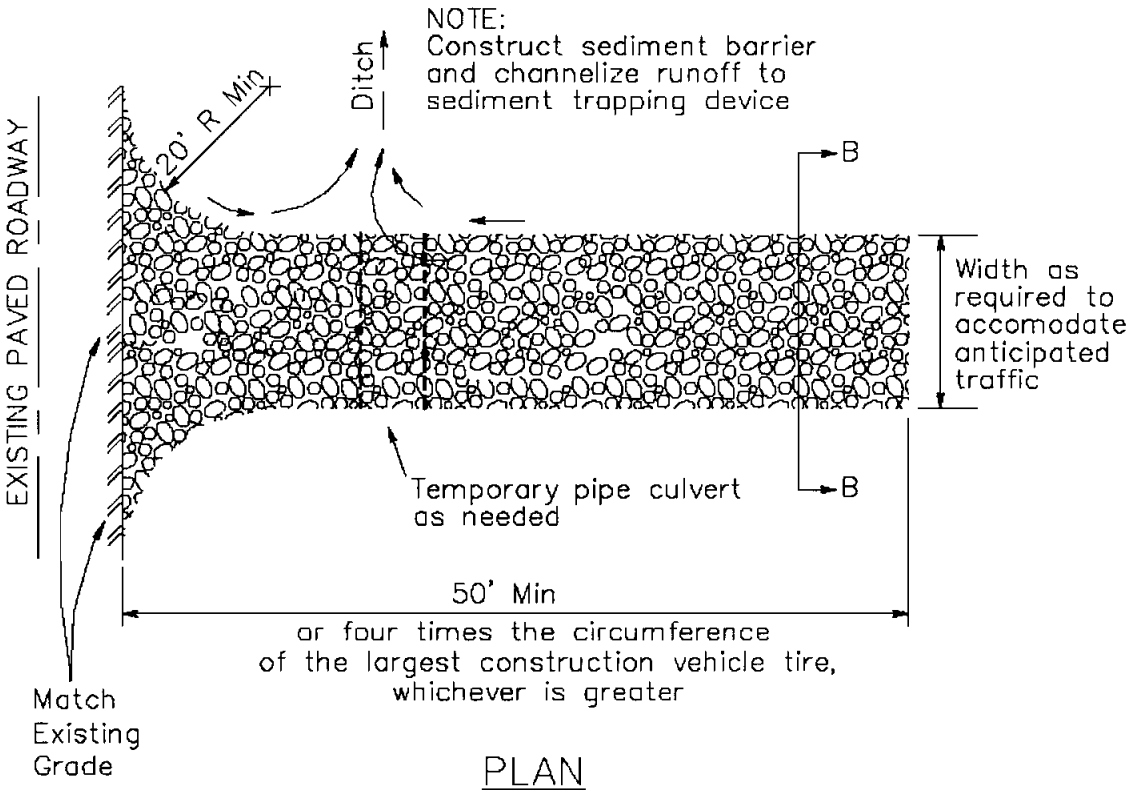

PLAN
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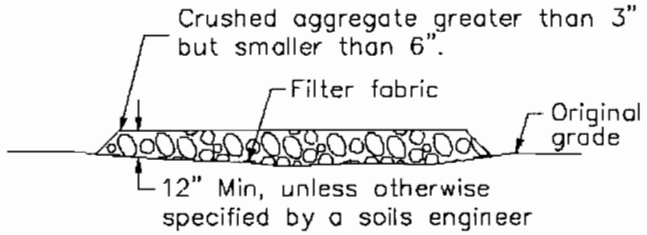
Stabilized Construction Entrance/Exit TC-1



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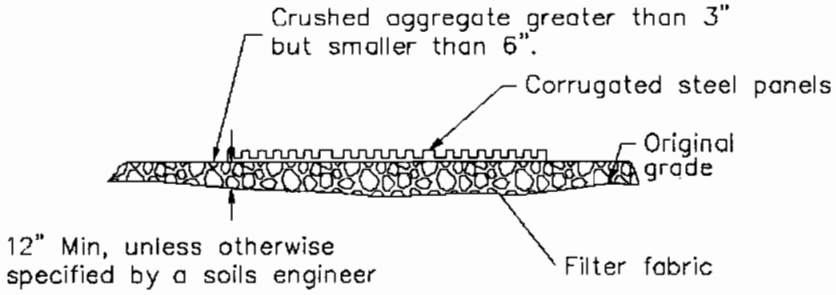
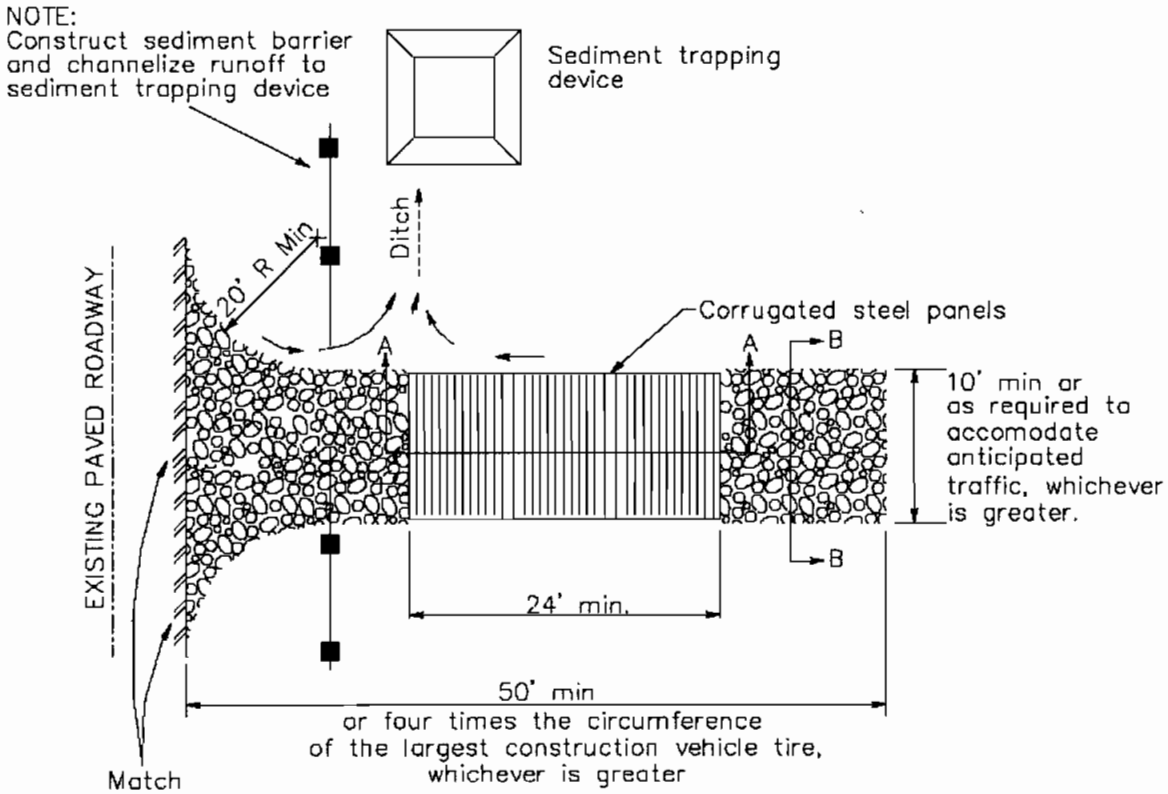


SECTION A–A
NOT TO SCALE



PLAN
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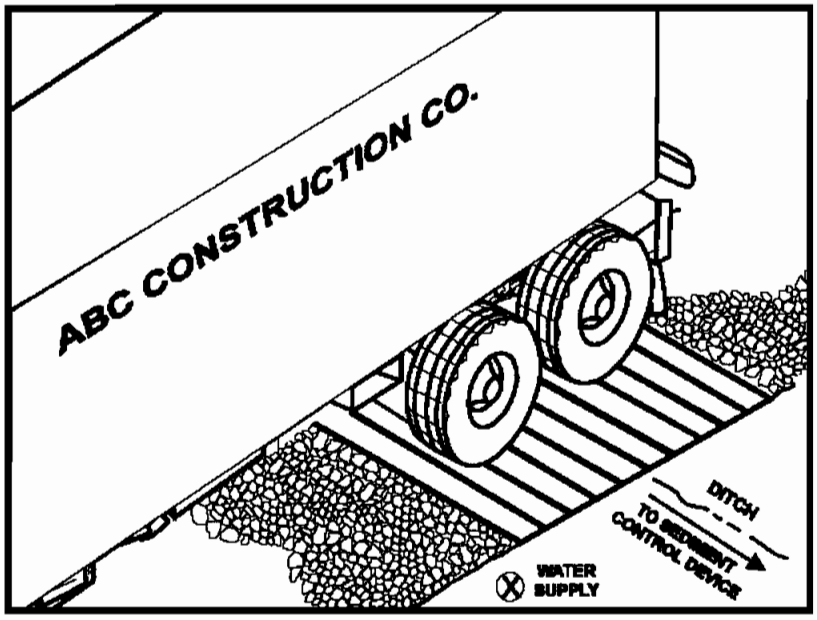
Entrance/Outlet Tire Wash TC-3



Objectives

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

TC-1 Stabilized Construction Entrance/Exit

Description and Purpose

A tire wash is an area located at stabilized construction access points to remove sediment from tires and under carriages and to prevent sediment from being transported onto public roadways.

Suitable Applications

Tire washes may be used on construction sites where dirt and mud tracking onto public roads by construction vehicles may occur.

Limitations

- The tire wash requires a supply of wash water.
- A turnout or doublewide exit is required to avoid having entering vehicles drive through the wash area.
- Do not use where wet tire trucks leaving the site leave the road dangerously slick.

Implementation

- Incorporate with a stabilized construction entrance/exit. See TC-1, Stabilized Construction Entrance/Exit.
- Construct on level ground when possible, on a pad of coarse aggregate greater than 3 in. but smaller than 6 in. A geotextile fabric should be placed below the aggregate.
- Wash rack should be designed and constructed/manufactured for anticipated traffic loads.

- Provide a drainage ditch that will convey the runoff from the wash area to a sediment trapping device. The drainage ditch should be of sufficient grade, width, and depth to carry the wash runoff.
- Use hoses with automatic shutoff nozzles to prevent hoses from being left on.
- Require that all employees, subcontractors, and others that leave the site with mud caked tires and undercarriages to use the wash facility.
- Implement SC-7, Street Sweeping and Vacuuming, as needed.

Costs

Costs are low for installation of wash rack.

Inspection and Maintenance

- Inspect and verify that activity–based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and of two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharge daily while non-stormwater discharges occur.
- Remove accumulated sediment in wash rack and/or sediment trap to maintain system performance.
- Inspect routinely for damage and repair as needed.

References

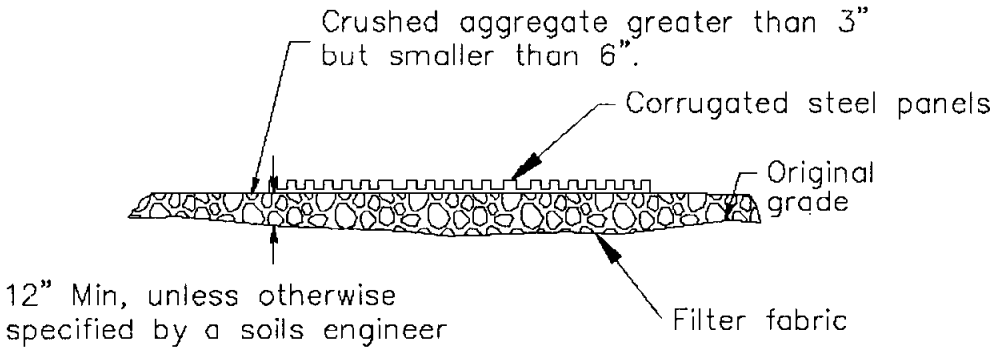
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.



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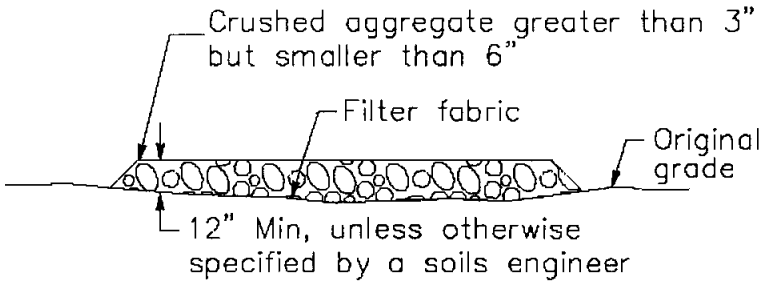

SECTION B–B
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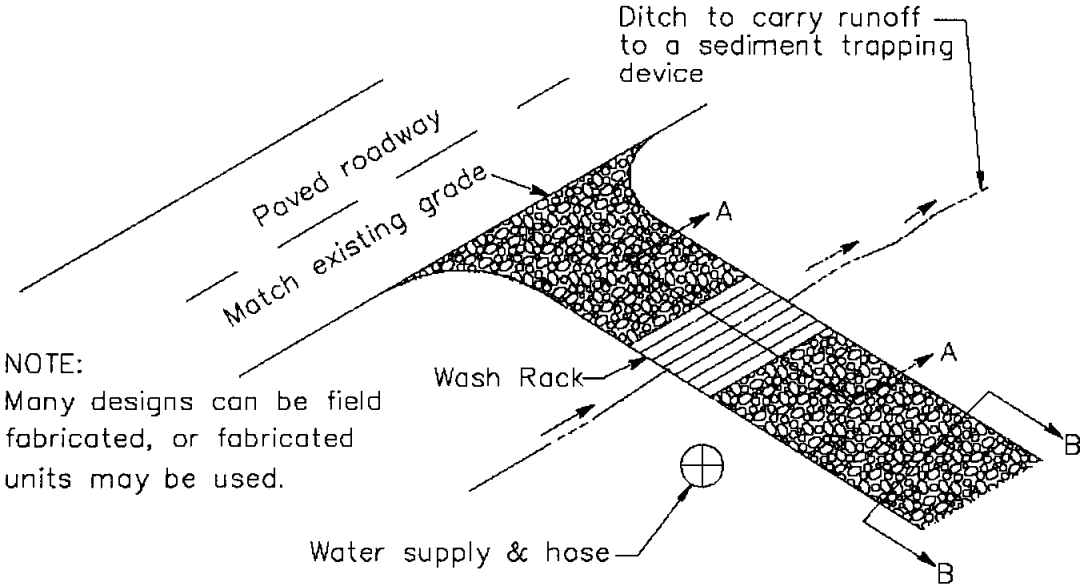
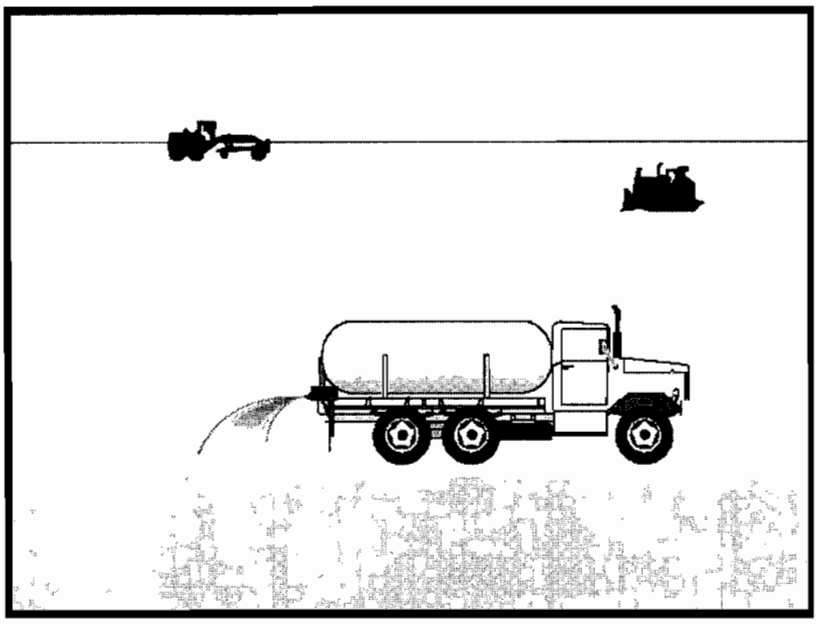


TYPICAL TIRE WASH
NOT TO SCALE

Wind Erosion Control WE-1



Objectives

EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	☑
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

Wind erosion or dust control consists of applying water or other dust palliatives as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

Suitable Applications

Wind erosion control BMPs are suitable during the following construction activities:

- Construction vehicle traffic on unpaved roads
- Drilling and blasting activities
- Sediment tracking onto paved roads
- Soils and debris storage piles
- Batch drop from front-end loaders
- Areas with unstabilized soil
- Final grading/site stabilization

Limitations

- Watering prevents dust only for a short period and should be applied daily (or more often) to be effective.
- Over watering may cause erosion.

- Oil or oil-treated subgrade should not be used for dust control because the oil may migrate into drainageways and/or seep into the soil.
- Effectiveness depends on soil, temperature, humidity, and wind velocity.
- Chemically treated sub grades may make the soil water repellant, interfering with long-term infiltration and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- Asphalt, as a mulch tack or chemical mulch, requires a 24-hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.

Implementation

General

California's Mediterranean climate, with short wet seasons and long hot dry seasons, allows the soils to thoroughly dry out. During these dry seasons, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment.

Dust control, as a BMP, is a practice that is already in place for many construction activities. Los Angeles, the North Coast, and Sacramento, among others, have enacted dust control ordinances for construction activities that cause dust to be transported beyond the construction project property line.

Recently, the State Air Resources Control Board has, under the authority of the Clean Air Act, started to address air quality in relation to inhalable particulate matter less than 10 microns (PM-10). Approximately 90 percent of these small particles are considered to be dust. Existing dust control regulations by local agencies, municipal departments, public works department, and public health departments are in place in some regions within California.

Many local agencies require dust control in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. The following are measures that local agencies may have already implemented as requirements for dust control from contractors:

- Construction and Grading Permits: Require provisions for dust control plans.
- Opacity Emission Limits: Enforce compliance with California air pollution control laws.
- Increase Overall Enforcement Activities: Priority given to cases involving citizen complaints.
- Maintain Field Application Records: Require records of dust control measures from contractor;
- Stormwater Pollution Prevention Plan: (SWPPP): Integrate dust control measures into SWPPP.

Dust Control Practices

Dust control BMPs generally stabilize exposed surfaces and minimize activities that suspend or track dust particles. The following table shows dust control practices that can be applied to site conditions that cause dust. For heavily traveled and disturbed areas, wet suppression (watering), chemical dust suppression, gravel asphalt surfacing, temporary gravel construction entrances, equipment wash-out areas, and haul truck covers can be employed as dust control applications. Permanent or temporary vegetation and mulching can be employed for areas of occasional or no construction traffic. Preventive measures would include minimizing surface areas to be disturbed, limiting onsite vehicle traffic to 15 mph, and controlling the number and activity of vehicles on a site at any given time.

SITE CONDITION	DUST CONTROL PRACTICES								
	Permanent Vegetation	Mulching	Wet Suppression (Watering)	Chemical Dust Suppression	Gravel or Asphalt	Silt Fences	Temporary Gravel Construction Entrances/Equipment Wash Down	Haul Truck Covers	Minimize Extent of Disturbed Area
Disturbed Areas not Subject to Traffic	X	X	X	X	X				X
Disturbed Areas Subject to Traffic			X	X	X		X		X
Material Stock Pile Stabilization			X	X		X			X
Demolition			X				X	X	
Clearing/ Excavation			X	X		X			X
Truck Traffic on Unpaved Roads			X	X	X		X	X	
Mud/Dirt Carry Out					X		X		

Additional preventive measures include:

- Schedule construction activities to minimize exposed area (EC-1, Scheduling).
- Quickly stabilize exposed soils using vegetation, mulching, spray-on adhesives, calcium chloride, sprinkling, and stone/gravel layering.
- Identify and stabilize key access points prior to commencement of construction.
- Minimize the impact of dust by anticipating the direction of prevailing winds.
- Direct most construction traffic to stabilized roadways within the project site.
- Water should be applied by means of pressure-type distributors or pipelines equipped with a spray system or hoses and nozzles that will ensure even distribution.
- All distribution equipment should be equipped with a positive means of shutoff.
- Unless water is applied by means of pipelines, at least one mobile unit should be available at all times to apply water or dust palliative to the project.

- If reclaimed waste water is used, the sources and discharge must meet California Department of Health Services water reclamation criteria and the Regional Water Quality Control Board requirements. Non-potable water should not be conveyed in tanks or drain pipes that will be used to convey potable water and there should be no connection between potable and non-potable supplies. Non-potable tanks, pipes, and other conveyances should be marked, "NON-POTABLE WATER - DO NOT DRINK."

- Materials applied as temporary soil stabilizers and soil binders also generally provide wind erosion control benefits.

- Pave or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads.

- Provide covers for haul trucks transporting materials that contribute to dust.

- Provide for wet suppression or chemical stabilization of exposed soils.

- Provide for rapid clean up of sediments deposited on paved roads. Furnish stabilized construction road entrances and vehicle wash down areas.

- Stabilize inactive construction sites using vegetation or chemical stabilization methods.

- Limit the amount of areas disturbed by clearing and earth moving operations by scheduling these activities in phases.

For chemical stabilization, there are many products available for chemically stabilizing gravel roadways and stockpiles. If chemical stabilization is used, the chemicals should not create any adverse effects on stormwater, plant life, or groundwater.

Costs

Installation costs for water and chemical dust suppression are low, but annual costs may be quite high since these measures are effective for only a few hours to a few days.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.

- Check areas protected to ensure coverage.

- Most dust control measures require frequent, often daily, or multiple times per day attention.

References

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

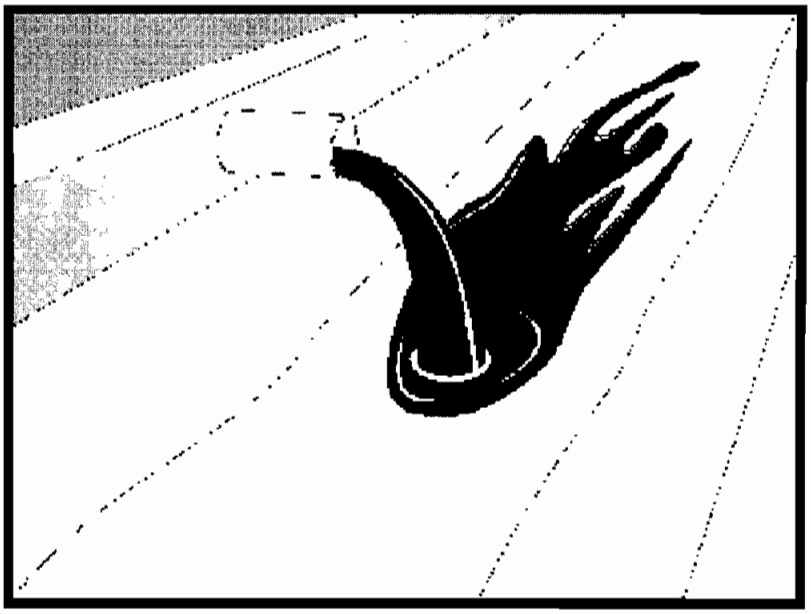
California Air Pollution Control Laws, California Air Resources Board, 1992.

Caltrans, Standard Specifications, Sections 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative".

Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Stormwater Quality Handbooks Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Illicit Connection/Discharge NS-6



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	☑
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Procedures and practices designed for construction contractors to recognize illicit connections or illegally dumped or discharged materials on a construction site and report incidents.

Suitable Applications

This best management practice (BMP) applies to all construction projects. Illicit connection/discharge and reporting is applicable anytime an illicit connection or discharge is discovered or illegally dumped material is found on the construction site.

Limitations

Illicit connections and illegal discharges or dumping, for the purposes of this BMP, refer to discharges and dumping caused by parties other than the contractor. If pre-existing hazardous materials or wastes are known to exist onsite, they should be identified in the SWPPP and handled as set forth in the SWPPP.

Implementation

Planning

- Review the SWPPP. Pre-existing areas of contamination should be identified and documented in the SWPPP.
- Inspect site before beginning the job for evidence of illicit connections, illegal dumping or discharges. Document any pre-existing conditions and notify the owner.

- Inspect site regularly during project execution for evidence of illicit connections, illegal dumping or discharges.
- Observe site perimeter for evidence for potential of illicitly discharged or illegally dumped material, which may enter the job site.

Identification of Illicit Connections and Illegal Dumping or Discharges

- **General** – unlabeled and unidentifiable material should be treated as hazardous.
- **Solids** - Look for debris, or rubbish piles. Solid waste dumping often occurs on roadways with light traffic loads or in areas not easily visible from the traveled way.
- **Liquids** - signs of illegal liquid dumping or discharge can include:
  - Visible signs of staining or unusual colors to the pavement or surrounding adjacent soils
  - Pungent odors coming from the drainage systems
  - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
  - Abnormal water flow during the dry weather season
- **Urban Areas** - Evidence of illicit connections or illegal discharges is typically detected at storm drain outfall locations or at manholes. Signs of an illicit connection or illegal discharge can include:
  - Abnormal water flow during the dry weather season
  - Unusual flows in sub drain systems used for dewatering
  - Pungent odors coming from the drainage systems
  - Discoloration or oily substances in the water or stains and residues detained within ditches, channels or drain boxes
  - Excessive sediment deposits, particularly adjacent to or near active offsite construction projects
- **Rural Areas** - Illicit connections or illegal discharges involving irrigation drainage ditches are detected by visual inspections. Signs of an illicit discharge can include:
  - Abnormal water flow during the non-irrigation season
  - Non-standard junction structures
  - Broken concrete or other disturbances at or near junction structures

Reporting

Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery. For illicit connections or discharges to the storm drain system, notify the local stormwater management agency. For illegal dumping, notify the local law enforcement agency.

Cleanup and Removal

The responsibility for cleanup and removal of illicit or illegal dumping or discharges will vary by location. Contact the local stormwater management agency for further information.

Costs

Costs to look for and report illicit connections and illegal discharges and dumping are low. The best way to avoid costs associated with illicit connections and illegal discharges and dumping is to keep the project perimeters secure to prevent access to the site, to observe the site for vehicles that should not be there, and to document any waste or hazardous materials that exist onsite before taking possession of the site.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect the site regularly to check for any illegal dumping or discharge.
- Prohibit employees and subcontractors from disposing of non-job related debris or materials at the construction site.
- Notify the owner of any illicit connections and illegal dumping or discharge incidents at the time of discovery.

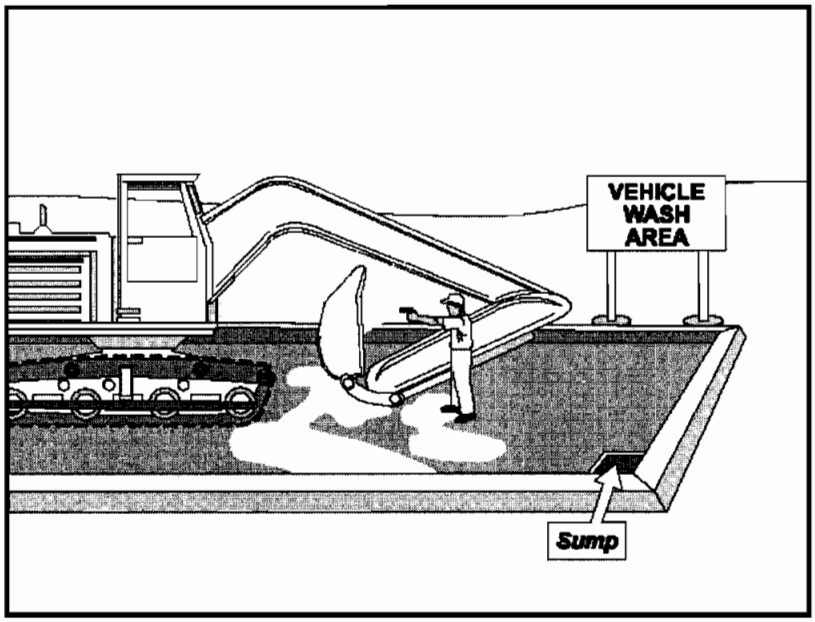
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Vehicle and Equipment Cleaning NS-8



Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TR-1, Stabilized Construction Entrance/Exit.

Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning onsite. Steam cleaning can generate significant pollutant concentrates.
- Cleaning of vehicles and equipment with soap, solvents or steam should not occur on the project site unless resulting wastes are fully contained and disposed of. Resulting wastes should not be discharged or buried, and must be captured and recycled or disposed according to the requirements of WM-10, Liquid Waste Management or WM-6, Hazardous Waste Management, depending on the waste characteristics. Minimize use of solvents. Use of diesel for vehicle and equipment cleaning is prohibited.
- All vehicles and equipment that regularly enter and leave the construction site must be cleaned offsite.
- When vehicle and equipment washing and cleaning must occur onsite, and the operation cannot be located within a structure or building equipped with appropriate disposal facilities, the outside cleaning area should have the following characteristics:
  - Located away from storm drain inlets, drainage facilities, or watercourses
  - Paved with concrete or asphalt and bermed to contain wash waters and to prevent runon and runoff
  - Configured with a sump to allow collection and disposal of wash water
  - No discharge of wash waters to storm drains or watercourses
  - Used only when necessary
- When cleaning vehicles and equipment with water:
  - Use as little water as possible. High-pressure sprayers may use less water than a hose and should be considered
  - Use positive shutoff valve to minimize water usage
  - Facility wash racks should discharge to a sanitary sewer, recycle system or other approved discharge system and must not discharge to the storm drainage system, watercourses, or to groundwater

Costs

Cleaning vehicles and equipment at an offsite facility may reduce overall costs for vehicle and equipment cleaning by eliminating the need to provide similar services onsite. When onsite cleaning is needed, the cost to establish appropriate facilities is relatively low on larger, long-duration projects, and moderate to high on small, short-duration projects.

Inspection and Maintenance

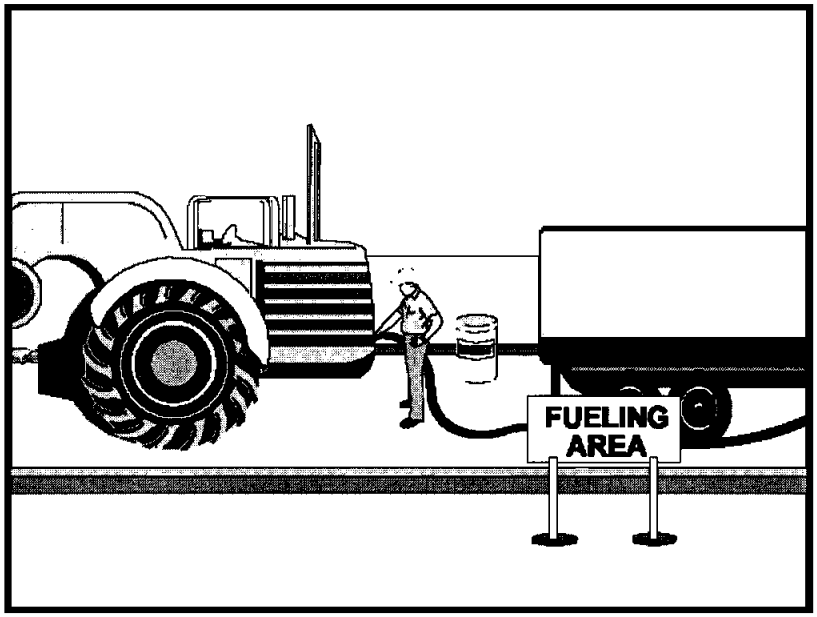
- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Inspection and maintenance is minimal, although some berm repair may be necessary.
- Monitor employees and subcontractors throughout the duration of the construction project to ensure appropriate practices are being implemented.
- Inspect sump regularly and remove liquids and sediment as needed.
- Prohibit employees and subcontractors from washing personal vehicles and equipment on the construction site.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Swisher, R.D. Surfactant Biodegradation, Marcel Decker Corporation, 1987.

Vehicle and Equipment Fueling NS-9



Objectives

EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Vehicle equipment fueling procedures and practices are designed to prevent fuel spills and leaks, and reduce or eliminate contamination of stormwater. This can be accomplished by using offsite facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors in proper fueling procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment fueling takes place.

Limitations

Onsite vehicle and equipment fueling should only be used where it is impractical to send vehicles and equipment offsite for fueling. Sending vehicles and equipment offsite should be done in conjunction with TR-1, Stabilized Construction Entrance/ Exit.

Implementation

- Use offsite fueling stations as much as possible. These businesses are better equipped to handle fuel and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate fueling area at a site.
- Discourage "topping-off" of fuel tanks.

- Absorbent spill cleanup materials and spill kits should be available in fueling areas and on fueling trucks, and should be disposed of properly after use.
- Drip pans or absorbent pads should be used during vehicle and equipment fueling, unless the fueling is performed over an impermeable surface in a dedicated fueling area.
- Use absorbent materials on small spills. Do not hose down or bury the spill. Remove the adsorbent materials promptly and dispose of properly.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and large excavators, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- When fueling must take place onsite, designate an area away from drainage courses to be used. Fueling areas should be identified in the SWPPP.
- Dedicated fueling areas should be protected from stormwater runon and runoff, and should be located at least 50 ft away from downstream drainage facilities and watercourses. Fueling must be performed on level-grade areas.
- Protect fueling areas with berms and dikes to prevent runon, runoff, and to contain spills.
- Nozzles used in vehicle and equipment fueling should be equipped with an automatic shutoff to control drips. Fueling operations should not be left unattended.
- Use vapor recovery nozzles to help control drips as well as air pollution where required by Air Quality Management Districts (AQMD).
- Federal, state, and local requirements should be observed for any stationary above ground storage tanks.

Costs

- All of the above measures are low cost except for the capital costs of above ground tanks that meet all local environmental, zoning, and fire codes.

Inspection and Maintenance

- Vehicles and equipment should be inspected each day of use for leaks. Leaks should be repaired immediately or problem vehicles or equipment should be removed from the project site.
- Keep ample supplies of spill cleanup materials onsite.
- Immediately clean up spills and properly dispose of contaminated soil and cleanup materials.

References

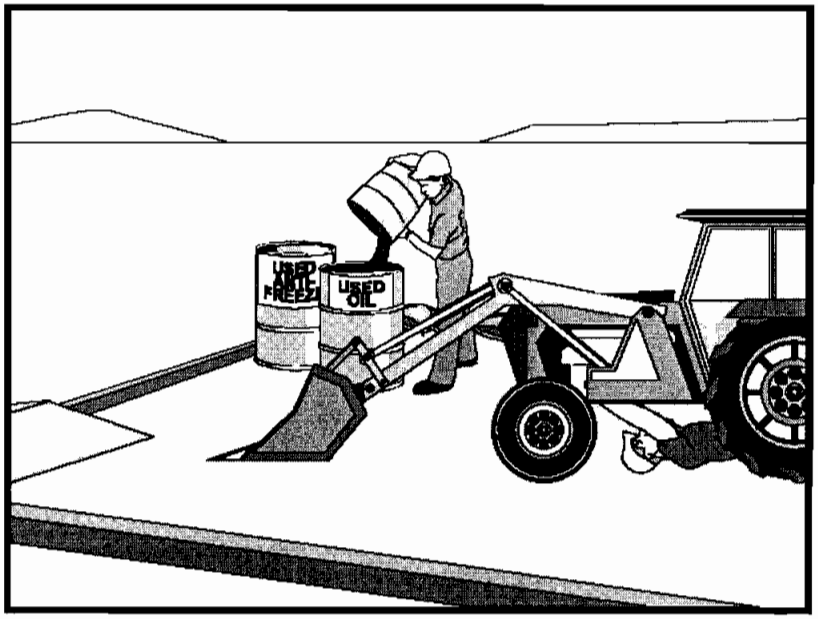
Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance, Working Group Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Vehicle & Equipment Maintenance NS-10



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents	
Sediment	
Nutrients	☑
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Prevent or reduce the contamination of stormwater resulting from vehicle and equipment maintenance by running a "dry and clean site". The best option would be to perform maintenance activities at an offsite facility. If this option is not available then work should be performed in designated areas only, while providing cover for materials stored outside, checking for leaks and spills, and containing and cleaning up spills immediately. Employees and subcontractors must be trained in proper procedures.

Suitable Applications

These procedures are suitable on all construction projects where an onsite yard area is necessary for storage and maintenance of heavy equipment and vehicles.

Limitations

Onsite vehicle and equipment maintenance should only be used where it is impractical to send vehicles and equipment offsite for maintenance and repair. Sending vehicles/equipment offsite should be done in conjunction with TR-1, Stabilized Construction Entrance/Exit.

Outdoor vehicle or equipment maintenance is a potentially significant source of stormwater pollution. Activities that can contaminate stormwater include engine repair and service, changing or replacement of fluids, and outdoor equipment storage and parking (engine fluid leaks). For further information on vehicle or equipment servicing, see NS-8, Vehicle and Equipment Cleaning, and NS-9, Vehicle and Equipment Fueling.

Implementation

- Use offsite repair shops as much as possible. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work offsite can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur onsite, use designated areas, located away from drainage courses. Dedicated maintenance areas should be protected from stormwater runon and runoff, and should be located at least 50 ft from downstream drainage facilities and watercourses.
- Drip pans or absorbent pads should be used during vehicle and equipment maintenance work that involves fluids, unless the maintenance work is performed over an impermeable surface in a dedicated maintenance area.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- All fueling trucks and fueling areas are required to have spill kits and/or use other spill protection devices.
- Use adsorbent materials on small spills. Remove the absorbent materials promptly and dispose of properly.
- Inspect onsite vehicles and equipment daily at startup for leaks, and repair immediately.
- Keep vehicles and equipment clean; do not allow excessive build-up of oil and grease.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic and transmission fluids. Provide secondary containment and covers for these materials if stored onsite.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- Drip pans or plastic sheeting should be placed under all vehicles and equipment placed on docks, barges, or other structures over water bodies when the vehicle or equipment is planned to be idle for more than 1 hour.
- For long-term projects, consider using portable tents or covers over maintenance areas if maintenance cannot be performed offsite.
- Consider use of new, alternative greases and lubricants, such as adhesive greases, for chassis lubrication and fifth-wheel lubrication.
- Properly dispose of used oils, fluids, lubricants, and spill cleanup materials.
- Do not place used oil in a dumpster or pour into a storm drain or watercourse.
- Properly dispose of or recycle used batteries.
- Do not bury used tires.
- Repair leaks of fluids and oil immediately.

Listed below is further information if you must perform vehicle or equipment maintenance onsite.

Safer Alternative Products

- Consider products that are less toxic or hazardous than regular products. These products are often sold under an "environmentally friendly" label.
- Consider use of grease substitutes for lubrication of truck fifth-wheels. Follow manufacturers label for details on specific uses.
- Consider use of plastic friction plates on truck fifth-wheels in lieu of grease. Follow manufacturers label for details on specific uses.

Waste Reduction

Parts are often cleaned using solvents such as trichloroethylene, trichloroethane, or methylene chloride. Many of these cleaners are listed in California Toxic Rule as priority pollutants. These materials are harmful and must not contaminate stormwater. They must be disposed of as a hazardous waste. Reducing the number of solvents makes recycling easier and reduces hazardous waste management costs. Often, one solvent can perform a job as well as two different solvents. Also, if possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous materials. For example, replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check the list of active ingredients to see whether it contains chlorinated solvents. The "chlor" term indicates that the solvent is chlorinated. Also, try substituting a wire brush for solvents to clean parts.

Recycling and Disposal

Separating wastes allows for easier recycling and may reduce disposal costs. Keep hazardous wastes separate, do not mix used oil solvents, and keep chlorinated solvents (like,-trichloroethane) separate from non-chlorinated solvents (like kerosene and mineral spirits). Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around. Provide cover and secondary containment until these materials can be removed from the site.

Oil filters can be recycled. Ask your oil supplier or recycler about recycling oil filters.

Do not dispose of extra paints and coatings by dumping liquid onto the ground or throwing it into dumpsters. Allow coatings to dry or harden before disposal into covered dumpsters.

Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Costs

All of the above are low cost measures. Higher costs are incurred to setup and maintain onsite maintenance areas.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Keep ample supplies of spill cleanup materials onsite.
- Maintain waste fluid containers in leak proof condition.
- Vehicles and equipment should be inspected on each day of use. Leaks should be repaired immediately or the problem vehicle(s) or equipment should be removed from the project site.
- Inspect equipment for damaged hoses and leaky gaskets routinely. Repair or replace as needed.

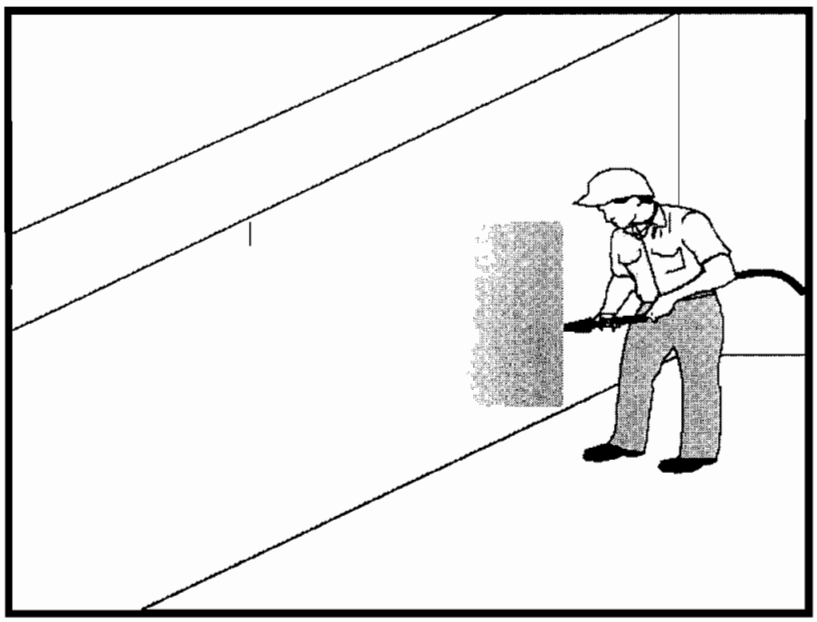
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Coastal Nonpoint Pollution Control Program; Program Development and Approval Guidance, Working Group, Working Paper; USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Concrete Curing NS-12



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Concrete curing is used in the construction of structures such as bridges, retaining walls, pump houses, large slabs, and structured foundations. Concrete curing includes the use of both chemical and water methods. Discharges of stormwater and non-stormwater exposed to concrete during curing may have a high pH and may contain chemicals, metals, and fines. Proper procedures reduce or eliminate the contamination of stormwater runoff during concrete curing.

Suitable Applications

Suitable applications include all projects where Portland Cement Concrete (PCC) and concrete curing chemicals are placed where they can be exposed to rainfall, runoff from other areas, or where runoff from the PCC will leave the site.

Limitations

None identified.

Implementation

Chemical Curing

- Avoid over spray of curing compounds.
- Minimize the drift of chemical cure as much as possible by applying the curing compound close to the concrete surface. Apply an amount of compound that covers the surface, but does not allow any runoff of the compound.

- Use proper storage and handling techniques for concrete curing compounds. Refer to WM-1, Material Delivery and Storage.
- Protect drain inlets prior to the application of curing compounds.
- Refer to WM-4, Spill Prevention and Control.

Water Curing for Bridge Decks, Retaining Walls, and other Structures

- Direct cure water away from inlets and watercourses to collection areas for infiltration or other means of removal in accordance with all applicable permits.
- Collect cure water at the top of slopes and transport or dispose of water in a non-erodible manner. See EC-9 Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.
- Utilize wet blankets or a similar method that maintains moisture while minimizing the use and possible discharge of water.

Costs

All of the above measures are generally low cost.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Ensure that employees and subcontractors implement appropriate measures for storage, handling, and use of curing compounds.
- Inspect cure containers and spraying equipment for leaks.

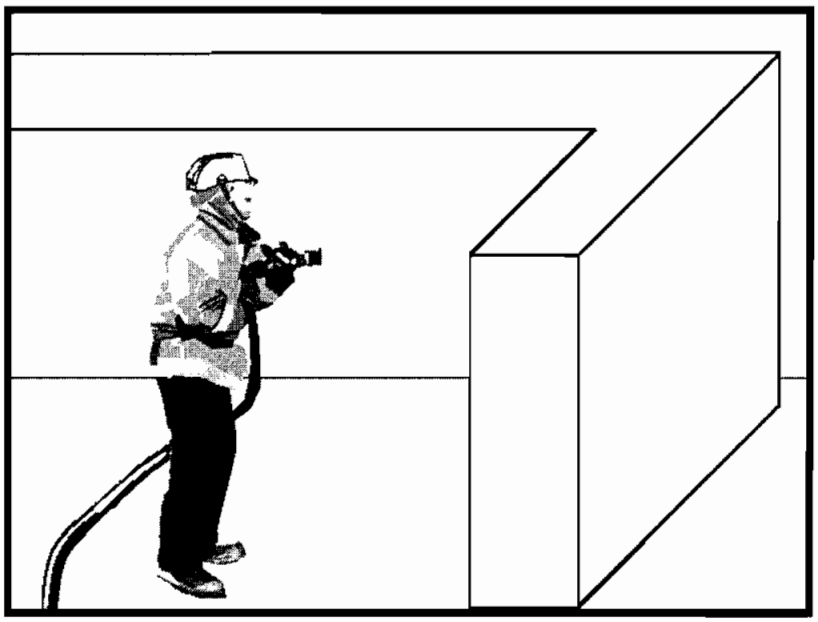
References

Blue Print for a Clean Bay-Construction-Related Industries: Best Management Practices for Stormwater Pollution Prevention; Santa Clara Valley Non Point Source Pollution Control Program, 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Concrete Finishing NS-13



Objectives		
EC	Erosion Control	
SE	Sediment Control	
TR	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☑

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	
Organics	☑

Potential Alternatives

None

Description and Purpose

Concrete finishing methods are used for bridge deck rehabilitation, paint removal, curing compound removal, and final surface finish appearances. Methods include sand blasting, shot blasting, grinding, or high pressure water blasting. Stormwater and non-stormwater exposed to concrete finishing by-products may have a high pH and may contain chemicals, metals, and fines. Proper procedures and implementation of appropriate BMPs can minimize the impact that concrete-finishing methods may have on stormwater and non-stormwater discharges.

Suitable Applications

These procedures apply to all construction locations where concrete finishing operations are performed.

Limitations

None identified.

Implementation

- Collect and properly dispose of water from high-pressure water blasting operations.
- Collect contaminated water from blasting operations at the top of slopes. Transport or dispose of contaminated water while using BMPs such as those for erosion control. Refer to EC-9, Earth Dikes and Drainage Swales, EC-10, Velocity Dissipation Devices, and EC-11, Slope Drains.

- Direct water from blasting operations away from inlets and watercourses to collection areas for infiltration or other means of removal (dewatering). Refer to NS-2 De-Watering Operations.
- Protect inlets during sandblasting operations. Refer to SE-10, Storm Drain Inlet Protection.
- Refer to WM-8, Concrete Waste Management for disposal of concrete based debris.
- Minimize the drift of dust and blast material as much as possible by keeping the blasting nozzle close to the surface.
- When blast residue contains a potentially hazardous waste, refer to WM-6, Hazardous Waste Management.

Costs

These measures are generally of low cost.

Inspection and Maintenance

- Inspect and verify that activity-based BMPs are in place prior to the commencement of associated activities. While activities associated with the BMP are under way, inspect weekly during the rainy season and at two-week intervals in the non-rainy season to verify continued BMP implementation.
- Inspect BMPs subject to non-stormwater discharges daily while non-stormwater discharges occur.
- Sweep or vacuum up debris from sandblasting at the end of each shift.
- At the end of each work shift, remove and contain liquid and solid waste from containment structures, if any, and from the general work area.

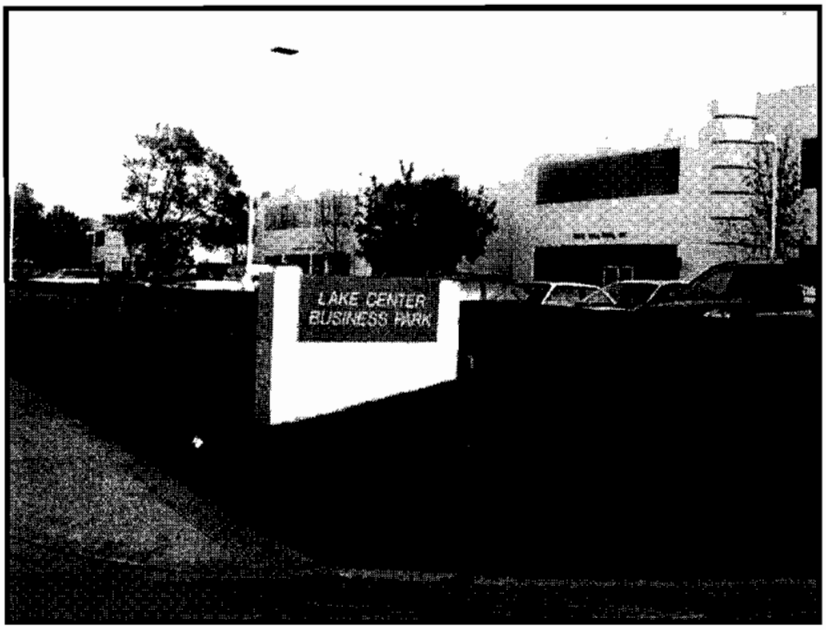
References

Blueprint for a Clean Bay: Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities; Santa Clara Valley Nonpoint Source Pollution Control Program, 1995.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

Stormwater Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Building & Grounds Maintenance SC-41



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	
Organics	

Description

Stormwater runoff from building and grounds maintenance activities can be contaminated with toxic hydrocarbons in solvents, fertilizers and pesticides, suspended solids, heavy metals, abnormal pH, and oils and greases. Utilizing the protocols in this fact sheet will prevent or reduce the discharge of pollutants to stormwater from building and grounds maintenance activities by washing and cleaning up with as little water as possible, following good landscape management practices, preventing and cleaning up spills immediately, keeping debris from entering the storm drains, and maintaining the stormwater collection system.

Approach

Reduce potential for pollutant discharge through source control pollution prevention and BMP implementation. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Switch to non-toxic chemicals for maintenance when possible.
- Choose cleaning agents that can be recycled.
- Encourage proper lawn management and landscaping, including use of native vegetation.

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- Encourage use of Integrated Pest Management techniques for pest control.
- Encourage proper onsite recycling of yard trimmings.
- Recycle residual paints, solvents, lumber, and other material as much as possible.

Suggested Protocols

Pressure Washing of Buildings, Rooftops, and Other Large Objects

- In situations where soaps or detergents are used and the surrounding area is paved, pressure washers must use a water collection device that enables collection of wash water and associated solids. A sump pump, wet vacuum or similarly effective device must be used to collect the runoff and loose materials. The collected runoff and solids must be disposed of properly.
- If soaps or detergents are not used, and the surrounding area is paved, wash runoff does not have to be collected but must be screened. Pressure washers must use filter fabric or some other type of screen on the ground and/or in the catch basin to trap the particles in wash water runoff.
- If you are pressure washing on a grassed area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the grass and not drain to pavement.

Landscaping Activities

- Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage, or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures on exposed soils.

Building Repair, Remodeling, and Construction

- Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.
- Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
- Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.
- Clean paintbrushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
- Use a storm drain cover, filter fabric, or similarly effective runoff control mechanism if dust, grit, wash water, or other pollutants may escape the work area and enter a catch basin. This is particularly necessary on rainy days. The containment device(s) must be in place at the beginning of the work day, and accumulated dirty runoff and solids must be collected and disposed of before removing the containment device(s) at the end of the work day.

- If you need to de-water an excavation site, you may need to filter the water before discharging to a catch basin or off-site. If directed off-site, you should direct the water through hay bales and filter fabric or use other sediment filters or traps.
- Store toxic material under cover during precipitation events and when not in use. A cover would include tarps or other temporary cover material.

Mowing, Trimming, and Planting

- Dispose of leaves, sticks, or other collected vegetation as garbage, by composting or at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Use mulch or other erosion control measures when soils are exposed.
- Place temporarily stockpiled material away from watercourses and drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Consider an alternative approach when bailing out muddy water: do not put it in the storm drain; pour over landscaped areas.
- Use hand weeding where practical.

Fertilizer and Pesticide Management

- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.
- Use less toxic pesticides that will do the job when applicable. Avoid use of copper-based pesticides if possible.
- Do not use pesticides if rain is expected.
- Do not mix or prepare pesticides for application near storm drains.
- Use the minimum amount needed for the job.
- Calibrate fertilizer distributors to avoid excessive application.
- Employ techniques to minimize off-target application (e.g., spray drift) of pesticides, including consideration of alternative application techniques.
- Apply pesticides only when wind speeds are low.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Irrigate slowly to prevent runoff and then only as much as is needed.
- Clean pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Dispose of empty pesticide containers according to the instructions on the container label.

- Use up the pesticides. Rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Implement storage requirements for pesticide products with guidance from the local fire department and County Agricultural Commissioner. Provide secondary containment for pesticides.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering and repair leaks in the irrigation system as soon as they are observed.

Training

- Educate and train employees on pesticide use and in pesticide application techniques to prevent pollution.
- Train employees and contractors in proper techniques for spill containment and cleanup.
- Be sure the frequency of training takes into account the complexity of the operations and the nature of the staff.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials, such as brooms, dustpans, and vacuum sweepers (if desired) near the storage area where it will be readily accessible.
- Have employees trained in spill containment and cleanup present during the loading/unloading of dangerous wastes, liquid chemicals, or other materials.
- Familiarize employees with the Spill Prevention Control and Countermeasure Plan.
- Clean up spills immediately.

Other Considerations

Alternative pest/weed controls may not be available, suitable, or effective in many cases.

Requirements

Costs

- Cost will vary depending on the type and size of facility.
- Overall costs should be low in comparison to other BMPs.

Maintenance

Sweep paved areas regularly to collect loose particles. Wipe up spills with rags and other absorbent material immediately, do not hose down the area to a storm drain.

Supplemental Information

Further Detail of the BMP

Fire Sprinkler Line Flushing

Building fire sprinkler line flushing may be a source of non-stormwater runoff pollution. The water entering the system is usually potable water, though in some areas it may be non-potable reclaimed wastewater. There are subsequent factors that may drastically reduce the quality of the water in such systems. Black iron pipe is usually used since it is cheaper than potable piping, but it is subject to rusting and results in lower quality water. Initially, the black iron pipe has an oil coating to protect it from rusting between manufacture and installation; this will contaminate the water from the first flush but not from subsequent flushes. Nitrates, poly-phosphates and other corrosion inhibitors, as well as fire suppressants and antifreeze may be added to the sprinkler water system. Water generally remains in the sprinkler system a long time (typically a year) and between flushes may accumulate iron, manganese, lead, copper, nickel, and zinc. The water generally becomes anoxic and contains living and dead bacteria and breakdown products from chlorination. This may result in a significant BOD problem and the water often smells. Consequently dispose fire sprinkler line flush water into the sanitary sewer. Do not allow discharge to storm drain or infiltration due to potential high levels of pollutants in fire sprinkler line water.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

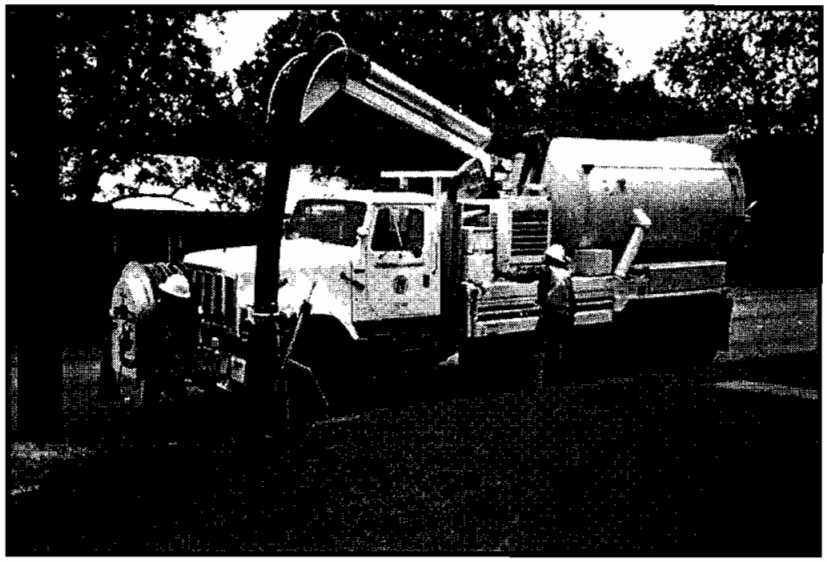
Mobile Cleaners Pilot Program: Final Report. 1997. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

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- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

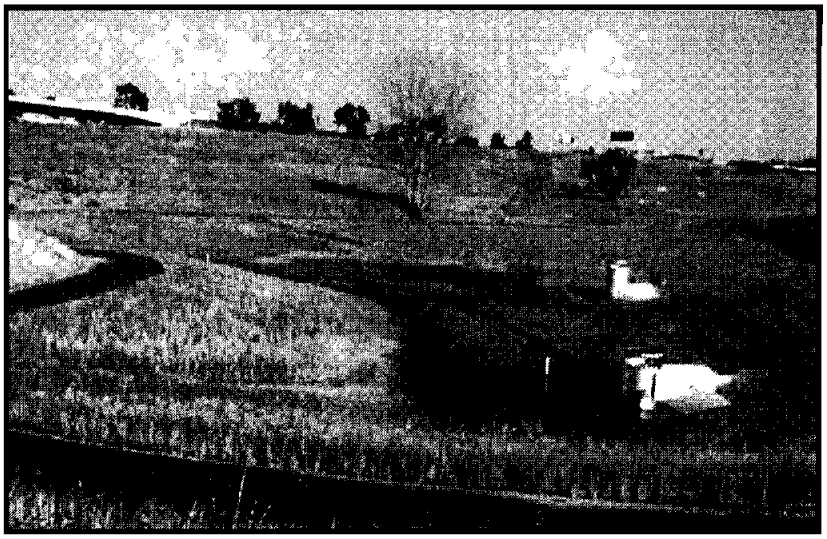
Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Extended Detention Basin TC-22



Maintenance Concerns, Objectives, and Goals

- Vector/Pest Control
- Sediment and Trash Removal
- Vegetation/Landscape Maintenance
- Re-suspension of settled material
- Clogging of the Outlet

General Description

Dry extended detention ponds (a.k.a. dry ponds, extended detention basins, detention ponds, extended detention ponds) are basins whose outlets have been designed to detain the stormwater runoff from a water quality design storm for some minimum time (e.g., 72 hours) to allow particles and associated pollutants to settle. Unlike wet ponds, these facilities do not have a large permanent pool. They can also be used to provide flood control by including additional flood detention storage.

Inspection/Maintenance Considerations

Inspections should be conducted semi-annually and after significant storm events to identify potential problems early. Most maintenance efforts will need to be directed toward vegetation management and vector control, which may focus on basic housekeeping practices such as removal of debris accumulations and vegetation management to ensure that the basin dewaters completely (recommended 72 hour residence time or less) to prevent creating mosquito and other vector habitats.

Targeted Constituents

✓	Sediment	▲
✓	Nutrients	●
✓	Trash	■
✓	Metals	▲
✓	Bacteria	▲
✓	Oil and Grease	▲
✓	Organics	▲

Legend ***(Removal Effectiveness)***

● Low ■ High

▲ Medium

CASQA
California Stormwater Quality Association

Inspection Activities	Suggested Frequency
■ Inspect after several storm events for bank stability, vegetation growth, and to determine if the desired residence time has been achieved. ■ Inspect outlet structure for evidence of clogging or outflow release velocities that are greater than design flow.	Post construction
■ Inspect for the following issues: differential settlement, cracking; erosion of pond banks or bottom, leakage, or tree growth on the embankment; the condition of the riprap in the inlet, clogging of outlet and pilot channels; standing water, slope stability, presence of burrows; sediment accumulation in the basin, forebay, and outlet structures; trash and debris, and the vigor and density of the grass turf on the basin side slopes and floor.	Semi-annual, after significant storms, or more frequent
■ Inspect for the following issues: subsidence, damage to the emergency spillway; inadequacy of the inlet/outlet channel erosion control measures; changes in the condition of the pilot channel, accumulated sediment volume, and semi-annual inspection items.	Annual
■ During inspections, changes to the extended storage pond or the contributing watershed should be noted, as these may affect basin performance.	Annual inspection
Maintenance Activities	**Suggested Frequency**
■ If necessary, modify the outlet orifice to achieve design values if inspection indicates modifications are necessary. ■ Repair undercut or eroded areas. ■ Mow side slopes. ■ Manage pesticide and nutrients. ■ Remove litter and debris. ■ Control mosquitoes as necessary.	As needed
■ Remove accumulated trash and debris from the basin, around the riser pipe, side slopes, embankment, emergency spillway, and outflow trash racks. The frequency of this activity may be altered to meet specific site conditions. ■ Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.	Semi-annual, or more frequent, as needed
■ Seed or sod to restore dead or damaged ground cover. ■ Repair erosion to banks and bottom as required.	Annual maintenance (as needed)
■ Supplement wetland plants if a significant portion have not been established (at least 50% of the surface area). ■ Remove nuisance plant species.	Annual maintenance (if needed)
■ Remove sediment from the forebay to reduce frequency of main basin cleaning.	3- to 5-year maintenance
■ Monitor sediment accumulation and remove accumulated sediment and regrade about every 10 years or when the accumulated sediment volume exceeds 10-20% of the basin volume, or when accumulation reaches 6 inches or if resuspension is observed. Clean in early spring so vegetation damaged during cleaning has time to re-establish.	Every 10-25 years

Additional Information

In most cases, sediment from extended detention basin does not contain toxins at levels posing a hazardous concern. Studies to date indicate that pond sediments are likely to meet toxicity limits and can be safely landfilled or disposed of onsite. Onsite sediment disposal is always preferable (if local authorities permit it) as long as the sediments are deposited away from the shoreline to prevent their re-entry into the pond.

Sediments should be tested for toxin in compliance with current disposal requirements if land uses in the catchment include commercial or industrial zones, or if visual or olfactory indications of pollution are noticed.

References

Metropolitan Council, Urban Small Sites Best Management Practices Manual. Available at: http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm

U.S. Environmental Protection Agency, Post-Construction Stormwater Management in New Development & Redevelopment BMP Factsheets. Available at: cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm

Ventura Countywide Stormwater Quality Management Program, Technical Guidance Manual for Stormwater Quality Control Measures. July, 2002.

Attachment C

BLACK & VEATCH

Calculation Record

Client Name: LS Power Page 1 of 11

Project Name: South Bay Energy Facility Project No.: 136469

Calculation Title: Drainage Calculations

Calculation No./File No.: 52.5906.01

Calculation Is: (check all that apply) ☐ Preliminary ☒ Final ☐ Nuclear Safety-Related

Objective Drainage Calculations for South Bay Energy Facility

Unverified Assumptions Requiring Subsequent Verification

No.	Assumption	Verified By	Date

See Page _____ of this calculation for additional assumptions.

This Section Used for Computer Generated Calculations

Program Name/Number: _____ Version: _____

Evidence of or reference to computer program verification, if applicable:

Bases or reference thereto supporting application of the computer program to the physical problem:

Review and Approval

Rev	Prepared By	Date	Verified By	Date	Approved By	Date
	Robert Nasset	5/15/06	MJ Tuttle	5/22/06	C. J. Schultz	5/22/06

BLACK & VEATCH

COMPUTER GENERATED CALCULATIONS

Owner: LS Power Computed By: G. V. Johnson

Plant: South Bay Energy Facility Unit: Date: May 16 20 06

Project No.: 136469 File No.: 52.5406.01

Title: Stormwater Detention Basin Analysis

PROGRAM NO.: HEC-1 VERSION: 4.1

RUN DATE: 5/16/06 RUN TIME:

CASE: NO. OF PAGES: 149

STATUS*

By: G.V. Johnson Date: 5/16 20 06

REVIEW AND APPROVAL

1. Input Data Printout

   Checked By: [signature] Date: 5/22 20 06

2. Output Data Printout

   Checked By: [signature] Date: 5/22 20 06

3. Approved: C. J. Schutty Date: 5/22 20 06

*No special indication of status is required for calculations other than those that are superseded or declared void.

BLACK & VEATCH

COMPUTER GENERATED CALCULATIONS

Owner: LS Power Computed By: G.V. Johnson

Plant: South Bay Energy Facility Unit: Date: May 16 20 06

Project No.: 136469 File No.: 52.5406.01

Title: Worksheet for Circular Channel

PROGRAM NO.: FlowMaster VERSION: 5.15

RUN DATE: 5/16/06 RUN TIME:

CASE: NO. OF PAGES: 1

STATUS*

By: G.V. Johnson Date: 5/16/05 20 06

REVIEW AND APPROVAL

1. Input Data Printout

   Checked By: [illegible] Date: 5/22 20 06

2. Output Data Printout

   Checked By: [illegible] Date: 5/22 20 06

3. Approved: C. J. Schutty Date: 5/22 20 06

*No special indication of status is required for calculations other than those that are superseded or declared void.

1.0 PURPOSE: Drainage Calculations for South Bay Energy Facility

2.0 REFERENCES:

1 B&V Drawing 136469-DS-0008 (Interim Site Arrangement) Rev. B

2 B&V Drawing 136469-SS-0001 (Pre-Construction Runoff and Drainage Plan) Rev. A

3 B&V Drawings 136469-CSTF-S3000 - S3005, S3900 (Grading and Drainage Plan Sheets) Rev. A

4 San Diego County Hydrology Manual, County of San Diego - Department of Public Works - Flood Control Section - 06/01/2003 (http://www.sdcounty.ca.gov/dpw/docs/hydrologymanual.pdf)

5 Urban Hydrology for Small Watersheds, U.S. Department of Agriculture - Natural Resources Conservation Service - Conservation Engineering Division Technical Release 55

6 Civil Engineering Reference Manual for the PE Exam, 9th edition, Michael R. Lindeburg

7 San Diego County Standard Urban Stormwater Mitigation Plan (SUSMP), County of San Diego - 02/10/2003 (http://www.sdcounty.ca.gov/dpw/watersheds/land_dev/susmp.html)

3.0 CONCLUSIONS:

3.1 See "Analysis" section of this calculation for all conclusions.

4.0 PROCEDURE/METHODOLOGY OF DESIGN:

4.1 Followed procedure outlined in Chapter 4 of Reference 4 and Chapter 3 of Reference 5. Pre-development discharge will be calculated. All developed area will be routed through a detention basin. The detention basin will be designed with sufficient capacity to maintain a maximum discharge equal to pre-development discharge.

5.0 ASSUMPTIONS:

5.1 All relevant assumptions are located within the "Analysis" section of this calculation. Those requiring verification will be listed on the cover sheet.

6.0 DEFINITIONS OF UNITS AND CONSTANTS

6.1 All required definitions of units and constants are located within the "Analysis" section of this calculation.

7.0 ANALYSIS/SOLUTION:

See attached calculation for the following sections:

	Page
7.1 Pre-Development Design Parameters	5
7.2 Pre-Development Time of Concentration Calculation	6
7.3 Post-Development Design Parameters	7
7.4 Post-Development Time of Concentration Calculation	8
7.5 Determine Ditch and Trench Drain Capacity	10
7.6 Stormwater Detention Basin Stage Discharge Relationship	11

8.0 ATTACHMENTS

Attachment A	Drawings
Attachment B	Flowmaster Output
Attachment C	Precipitation Distribution
Attachment D	HEC-1 Output Files
D.1	Pre-Development Output (8 pages)
D.2	Post-Development Output
D.2.1	50-Year Post-Development Output (52 pages)
D.2.2	100-Year Post-Development Output (40 pages)
D.2.3	85th Percentile Storm Post-Development Output (49 pages)

7.1 PRE-DEVELOPMENT DESIGN PARAMETERS

DESIGN PRECIPITATION EVENTS (Appendix B of Reference 4)

	6 Hour (inches)	24 Hour (inches)
1 year	NA	NA
2 year	1.0	1.6
5 year	1.4	2.4
10 year	1.6	3.0
25 year	2.0	3.4
50 year	2.3	3.8
100 year	2.5	4.4

COMPOSITE CURVE NUMBER - PRE-DEVELOPMENT

See Reference 2. Plant stormwater will be discharged into Sub Basin 1. The pre-development discharge of Sub Basin 1 will be calculated to determine maximum post-development discharge.

Ground Cover / Land Use	Hydrologic Condition	% of Area	Area (ac)	CN*	Area x CN
Herbaceous - Mixture of grass, weeds, and low-growing brush	Fair	75%	4.3575	90	392.175
Urban District (Industrial)	NA	25%	1.4525	93	135.0825
Total			5.81		527.2575
Composite CN (Area*CN/Area)	90.75				

* Reference 4, Table 4-2, HSB = D, Appendix B

PZN ADJUSTMENT FACTORS: (Reference 4, Table 4-6, Table 4-10, Appendix C)

Coast: PZN = 2.0 > 35-year return

Adjustment Factor = 2.0

Adjusted Curve Number = 90.75

7.2 PRE-DEVELOPMENT TIME OF CONCENTRATION

(For TC Calculation Method, see Reference 5, Chapter 3)

Sheet Flow

1. Surface Discription (table 3-1)	Smooth Surface	
2. Manning's roughness coeff., n (table 3-1)	0.011	
3. Flow length, L (total L <= 300 ft)	300	ft
4. Two-yr 24-hr rainfall, P2	1.6	in
5. Land slope, s	0.01	ft/ft
6. $Tt = 0.007*(nL)^{0.8}/(P_2^{0.5}s^{0.4})$	0.0908	hrs

Shallow Concentrated Flow

7. Surface description (paved or unpaved)	Top Unpaved		
8. Flow length, L	308	ft	
9. Watercourse slope, s	0.01		
10. Average velocity, V (figure 3-1)	1.61345	ft/s	(unpaved)
11. Tt = L/(3600 V)	0.053026	hrs	

Channel flow

12. Channel Depth	0.75	ft
13. Cross sectional flow area, a	2.5	ft^2
14. Wetted perimeter, p_w	4.6	ft
15. Hydraulic radius, r = a/Pw	0.543478	ft
16. Channel slope, s	0.005	ft/ft
17, Manning's roughness coeff., n	0.011	(concrete)
18. Velocity (V)	6.378718	ft/s
19. Flow length, L	358	ft
20. Tt = L/(3600 V)	0.01559	hrs

21. Watershed or subarea Tc	0.1594	hrs =	9.562023	min
22. Corps Lag (Tp) = 0.80Tc (Eq 4-24, Reference 4)	0.1275	hrs =	7.649618	min

7.3 POST-DEVELOPMENT DESIGN PARAMETERS

COMPOSITE CURVE NUMBER - POST-DEVELOPMENT

	Area (ac)	CN*
Undeveloped Area to Ditch (In Buffer, See Note 1)	2.7214	90

Note 1: See Reference 2. The undeveloped buffer area is area of Sub Basin 1 that discharges off site but will not be routed through the detention basin because it is in the environmental buffer. However, this area must be accounted for in the total discharge calculation. Therefore, Maximum Detention Basin Discharge = Pre-Development Discharge - Undeveloped Area Discharge.

Developed Areas	Area (ac)	CN*	Area x CN
Within Property:			
Impervious Areas (buildings)	2.5420	98	249.116
Impervious Areas (roads)	2.3177	98	227.1346
Aggregate Areas	13.0415	91	1186.7765
Utility Easement Areas:			
Impervious Areas (roads)	0.1442	98	14.1316
Aggregate Areas	2.2341	91	203.3031
Total (Developed Areas)	20.2795		1880.4618

Composite CN (Developed Area) = (Area*CN/Area)	92.73

	Area (ac)	CN
Pond Area	1.3698	95

* Reference 4, Table 4-2, HSB = D, Appendix B

PZN ADJUSTMENT FACTORS: (Reference 4, Table 4-6, Table 4-10, Appendix C)

Coast: PZN = 2.0 > 35-year return

Developed Area Adjustment Factor = 2.0

Adjusted Curve Number = 90 for Undeveloped Area
92.73 for Developed Areas (Not including pond)
95 for pond

7.4 POST-DEVELOPMENT DESIGN PARAMETERS

TIME OF CONCENTRATION (DITCH) (For TC Calculation Method, see Reference 5, Chapter 3)

Sheet Flow

1. Surface Discription (table 3-1)	Aggregate	
2. Manning's roughness coeff., n (table 3-1)	0.011	
3. Flow length, L (total L <= 300 ft)	190	ft
4. Two-yr 24-hr rainfall, P2	1.6	in
5. Land slope, s	0.0025	ft/ft
6. $Tt = 0.007*(nL)^{0.8}/(P_2^{0.5}s^{0.4})$	0.1096	hrs

Shallow Concentrated Flow

7. Surface description (paved or unpaved)	Paved	
8. Flow length, L	168	ft
9. Watercourse slope, s	0.0025	
10. Average velocity, V (figure 3-1)	1.01641	ft/s
11. Tt = L/(3600 V)	0.045913	hrs

Channel flow

12. Channel Depth	1.6	ft	
13. Cross sectional flow area, a	14.08	ft^2	(Using 3:1 ditch with 4' bottom)
14. Wetted perimeter, p_w	14.12	ft	
15. Hydraulic radius, r = a/Pw	0.997167	ft	
16. Channel slope, s	0.0025	ft/ft	
17, Manning's roughness coeff., n	0.033		gravel
18. V	2.25331	ft/s	
19. Flow length, L	745	ft	
20. Tt = L/(3600 V)	0.09184	hrs	

21. Watershed or subarea Tc	0.2474	hrs =	14.84	min
22. Corps Lag (Tp) = 0.80Tc (Eq 4-24, Reference 4)	0.1979	hrs =	11.88	min

TIME OF CONCENTRATION (BUFFER AREA) (For TC Calculation Method, see Reference 5, Chapter 3)

See Note 1 on Page 5 for definition of buffer area.

Sheet Flow

1. Surface Discription (table 3-1)	Aggregate	
2. Manning's roughness coeff., n (table 3-1)	0.011	
3. Flow length, L (total L <= 300 ft)	300	ft
4. Two-yr 24-hr rainfall, P2	1.6	in
5. Land slope, s	0.0028	ft/ft
6. $Tt = 0.007*(nL)^{0.8}/(P_2^{0.5}s^{0.4})$	0.1510	hrs

Shallow Concentrated Flow

7. Surface description (paved or unpaved)	Unpaved	
8. Flow length, L	19	ft
9. Watercourse slope, s	0.0028	
10. Average velocity, V (figure 3-1)	0.853757	ft/s
11. Tt = L/(3600 V)	0.006182	hrs

Channel flow - Grass

12. Channel Depth	0.73	ft	
13. Cross sectional flow area, a	4.52	ft^2	(Using 3:1 ditch with 4' bottom)
14. Wetted perimeter, p_w	8.61	ft	
15. Hydraulic radius, r = a/Pw	0.524971	ft	
16. Channel slope, s	0.00375	ft/ft	
17, Manning's roughness coeff., n	0.027		Grass
18. V	2.199184	ft/s	
19. Flow length, L	376	ft	
20. Tt = L/(3600 V)	0.047492	hrs	

Channel flow - Concrete

12. Channel Depth	0.56	ft	
13. Cross sectional flow area, a	1.4	ft^2	(Existing Channel)
14. Wetted perimeter, p_w	3.02	ft	
15. Hydraulic radius, r = a/Pw	0.463576	ft	
16. Channel slope, s	0.005	ft/ft	
17, Manning's roughness coeff., n	0.011		Concrete
18. V	0.478	ft/s	
19. Flow length, L	353	ft	
20. Tt = L/(3600 V)	0.205137	hrs	

21. Watershed or subarea Tc	0.4098	hrs =	24.59	min
22. Corps Lag (Tp) = 0.80Tc (Eq 4-24, Reference 4)	0.3279	hrs =	19.67	min

7.5 DETERMINE DITCH AND TRENCH DRAIN REQUIRED CAPACITY

1) DETERMINE RAINFALL INTENSITY, I (in/hr)

$I = 7.44 \times P_6 \times D^{-0.645}$		(Reference 4, Figure 3-2)
$P_6 = 2.3$	in	(50 year, 6 Hour Precipitation, Reference 4 Appendix B)
$D = 15$	min	(Post-Development Time of Concentration, See Calculation on Page 6)
$I = 2.98$	in/hr	

2) CHECK DITCH CAPACITY

Watershed	Total Area	Grass Areas		Aggregate Areas		Asphalt Areas (Road)		Foundations		Weighted C-value	Intensity, I (in/hr)	Q_{runoff} = CIA (cfs)
		Area, A_{G1} (acres)	Runoff Coefficient, C	Area, A_{G2} (acres)	Runoff Coefficient, C	Area, A_s (acres)	Runoff Coefficient, C	Area, A_f (acres)	Runoff Coefficient, C			
Ditch 1 (Plant West)	2.8896	0	0.3	1.2129	0.75	0.6931	0.85	0.9836	0.95	0.84	2.98	7.26
Ditch 2 (Plant East)	6.5352	0	0.3	4.0114	0.75	1.4685	0.85	1.0553	0.95	0.80	2.98	15.69
Ditch 3 (Combine)[3]	0.66223	0	0.3	0.30843	0.75	0.1561	0.85	0.1977	0.95	0.83	2.98	1.65
Ditch 4 (South)	6.466	0	0.3	6.466	0.75	0	0.85	0	0.95	0.75	2.98	14.47
Ditch 5 (Discharge)	The detention basin discharges into Ditch 5 at maximum of 5 cfs (See Page 9).											

	Depth	Base	A (ft^2) =	p_w (ft)	r (ft) = a/pw	s (ft/ft)	n	V (ft/s)	$Q_{capacity}$ >	Q_{runoff}	Depth Req.[2]
Ditch 1 (Plant West)	2.11	4	21.7963	17.34	1.26	0.0025	0.033	2.629	57.302	7.26	0.77
Ditch 2 (Plant East)	2.2	4	23.32	17.91	1.30	0.0025	0.033	2.692	62.766	15.69	1.08
Ditch 3 (Combine)[3]	2.28	4	24.7152	18.42	1.34	0.0025	0.033	2.746	67.877	24.60	1.42
Ditch 4 (Subs. South)	2	6	24	18.65	1.29	0.0025	0.033	2.671	64.105	14.47	0.84
Ditch 5 (Discharge)	1	4	7	10.32	0.68	0.0025	0.033	1.742	12.196	5.00	0.57

Note [1]: All Ditches have 3:1 side slopes

Note [2]: Depth Required is minimum depth needed for Q_{runoff}.

Note [3]: Ditch 3 must also contain runoff from Ditches 1 and 2

3) CHECK TRENCH DRAIN CAPACITY

Trench No.	Total Area	Grass Areas		Gravel Areas		Asphalt Areas (Road)		Foundations		Weighted C-value	Intensity, I (in/hr)	Q_{runoff} = CIA (cfs)
		Area, A_{G1} (acres)	Runoff Coefficient, C	Area, A_{G2} (acres)	Runoff Coefficient, C	Area, A_s (acres)	Runoff Coefficient, C	Area, A_f (acres)	Runoff Coefficient, C			
T-1	2.8896	0	0.3	1.2129	0.75	0.6931	0.85	0.9836	0.95	0.84	2.98	7.26
T-2	10.08703	0	0.3	5.53273	0.75	2.3177	0.85	2.2366	0.95	0.82	2.98	24.60
T-3	6.5352	0	0.3	4.0114	0.75	1.4685	0.85	1.0553	0.95	0.80	2.98	15.69
T-4	1.7398	0	0.3	1.0779	0.75	0.6619	0.85	0	0.95	0.79	2.98	4.09
T-5	1.3341	0	0.3	0.627	0.75	0.2179	0.85	0.4892	0.95	0.84	2.98	3.34

Trench No.	Depth	Base	A (ft^2) =	p_w (ft)	r (ft) = a/pw	s (ft/ft)	n	V (ft/s)	$Q_{capacity}$ >	Q_{runoff}	Depth Req.[2]
T-1	2.61	2	5.22	7.22	0.72	0.0025	0.011	5.456	28.479	7.26	0.69
T-2	2.90	2	5.8	7.80	0.74	0.0025	0.011	5.559	32.241	24.60	1.74
T-3	2.70	2	5.4	7.40	0.73	0.0025	0.011	5.490	29.644	15.69	1.23
T-4	2.15	2	4.3	6.30	0.68	0.0025	0.011	5.250	22.576	4.09	0.46
T-5	1.14	2	2.28	4.28	0.53	0.0025	0.011	4.451	10.148	3.34	0.41

4) TRENCH DRAIN TABLE

Trench No.	Length	Inlet Invert Elevation	Outlet Invert Elevation
T-1	54	20.39	20.26
T-2	40	20.10	20.00
T-3	44	20.30	20.19
T-4	40	20.85	20.75
T-5	30	21.86	21.79

5) RIP RAP TABLE

No.	V_a	$Q_{discharge}$	TW	D_{50}	T	D_0	Outlet L_a	Inlet L_a	W	
T-1	5.456	7.26	0.69	6.00	9	2.00	19	5	NA	
T-2	5.559	24.60	1.74	6.00	9	2.00	40	5	22.0	
T-3	5.490	15.69	1.23	6.00	9	2.00	31	5	NA	
T-4	5.250	4.09	0.46	6.00	9	2.00	17	5	NA	
T-5	4.451	3.34	0.41	6.00	9	2.00	16	5	NA	
Ditch Subs. South	2.671	14.47	0.84	6.00	9	2.00	23	NA	15.3	(Ditch width is greater, use ditch width)
C-1	5.240	5.00	0.91	6.00	9	1.25	19	NA	NA	

TW = tailwater depth, ft

D_0 = diamter culvert, width of trench drain, or total depth of ditch, ft

D_{50} = median stone diameter, in — D_{50} = Maximum of 6" or $[0.02*Q^{4/3}/(TW*D_0)]*12$

T = rip rap thickness (max of 9", or 1.5 * D50)

L_a = rip rap apron length, ft — Eq 1) Apron Length, La = $1.8*Q/(D_0^{3/2})+7D_0$ for $TW < D_0/2$

Eq 2) Apron Length, La = $3*Q/(D_0^{3/2})+7D_0$ for $TW > D_0/2$

W = rip rap apron width, ft (applicable only if there is no well defined channel downstream) — $W = 3D_0 + 0.4La$

7.6 STORMWATER BASIN STAGE - DISCHARGE RELATIONSHIP:

Elevation	Area		Volume below	
16	1.0606	acres	0	Cubic Yards
17	1.1371	acres	1,603.70	CY
18	1.2128	acres	3,468.10	CY
19	1.2878	acres	5,444.90	CY
20	1.3620	acres	7,535.00	CY

References: FlowMaster v5.15, Haestad Methods, Waterbury, CT.
U.S. Dept. of Transportation, FHA, Hydraulic Charts for the Selection of Highway Culverts.

Discharge Culvert:

Diameter:	15 inches
Material:	CMP
Length:	150 feet
U/S Invert:	16.00 ft, msl.
D/S Invert:	15.43 ft, msl.
Slope:	0.0038 ft/ft
Entrance Type:	manufactured entrance

Elevation	Q (cfs)
16.00	0
16.10	0.03
16.43	1.0
16.63	1.5
16.83	2.0
17.68	3.0
18.58	4.0
19.78	5.0

All Elevations are Headwater Elevations from the culvert charts with outlet control, except Elev. 16.10, which is open channel flow with 0.10 feet normal depth (see attached FlowMaster worksheet).

PRECIPITATION DISTRIBUTION:
See attached constructed distribution based on Section 6 of Reference 4.

HEC - 1 MODEL OUTPUT SUMMARY (See attached for HEC-1 Output files)

Requirement:	Post-Development Peak Discharge <	Pre-Development Peak Discharge	
	Pre-Development Peak Discharge =	11 cfs	
	50-Year Post-Development Peak Discharge =	7 cfs	**OK**
	100-Year Post-Development Peak Discharge =	9 cfs	**OK**
Requirement:	50-Year Post-Development Peak Stage <	19 [1]	
	50-Year Post-Development Peak Stage =	18.63	**OK**
Check:	100-Year Post-Development Peak Stage <	20	
	100-Year Post-Development Peak Stage =	19.28	**OK**
Requirement:	Post-Development 85th % Storm Time to Drawdown[2] =	24 < x < 72 hours	
	Post-Development 85th % Storm Time to Drawdown =	61 hours	**OK**

Note 1: Reference 7 requries 1 foot of freeboard for detention basin for the 50 year design event. Top elevation of basin is 20, therefore maximum peak stage allowable is 19. Black & Veatch standard design also checks to see if the 100 year peak stage does not exceed the top elevation of the basin.

Note 2: Appendix F of Reference 7 states Time to Drawdown for Detention Basins must be within 24 to 72 hours.