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CH2MHILL

January 17, 2007
322752

DOCKET
06-AFC-2
DATE JAN 17 2007
RECD. JAN 17 2007

Mr. Robert Worl
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: AES Highgrove Project (06-AFC-2)
Informal Data Response, Set 1A

Dear Bob:

On behalf of the AES Highgrove LLC, please find attached one original and 12 copies of Informal Data Response, Set 1A, in response to Staff's oral Data Requests at the Issue Resolution Workshop held on November 16, 2006.

Please call me if you have any questions.

Sincerely,

CH2M HILL

John L. Carrier, J.D.
Program Manager

c: Project File
Proof of Service List

AES HIGHGROVE PROJECT (06-AFC-2)

INFORMAL DATA RESPONSE, SET 1A

(Air Quality, Cultural Resources, Soil and Water Resources, and Waste Management)

Submitted by

AES Highgrove, LLC.

January 17, 2007

CH2MHILL

2485 Natomas Park Drive, Suite 600
Sacramento, California 95833-2937

AES HIGHGROVE PROJECT
(06-AFC-2)
INFORMAL DATA RESPONSES, SET 1A

Technical Area: Air Quality
CEC Authors: Joe Loyer

BACKGROUND: NATURAL GAS SULFUR CONTENT

The AFC indicates that the facility will use natural gas with a maximum sulfur content of 0.25 grains per 100 standard cubic feet (gr/100scf). Staff has seen in previous siting cases that the delivered natural gas can contain as much as 1gr sulfur/100scf. If higher sulfur content natural gas fuel is used at the facility, SOx and PM emissions may be underestimated.

DATA REQUEST

AQ-1. Please identify any unmonitored natural gas injection points for gas supplied to AES Highgrove.

Response: Per May Lew of Sempra Utilities (So Cal Gas), the only gas that would be going to the AES Highgrove plant is border gas; and border gas is monitored for sulfur at all border receipt points.

AES HIGHGROVE PROJECT
(06-AFC-2)
INFORMAL DATA RESPONSES, SET 1A

Technical Area: Cultural Resources
CEC Author: Dorothy Torres and Beverly Bastian

BACKGROUND

Highgrove Hydroelectric Plant (CA-RIV-9525), built in approximately 1887 as the first commercial hydroelectric plant in California and destroyed by fire in 1915, is identified in the Cultural Resources Section of the AFC as a California Point of Historic Interest, but the AFC provided no further discussion of this resource. Staff drove the proposed gas line route in September 2006, and observed that the stone masonry foundations of the old hydro plant are still intact a few feet from the gas line route, and the hydro plant's penstock still extends under Iowa Avenue. This resource, located adjacent to the proposed gas pipeline, is potentially an important historic archaeological deposit. The Department of Parks and Recreation form 523 (DPR 523) or other documentation for this site was not included with the California Historical Resources Information System (CHRIS) information provided to the Energy Commission by the applicant.

DATA REQUESTS

CR-1 Please provide a copy of the DPR 523 or other documentation that was submitted to the Office of Historic Preservation to qualify the Highgrove Hydroelectric Plant as a California Point of Historic Interest.

Response: The initial DRP form for the Highgrove Hydroelectric Plant is provided as Figure 1, of Attachment CR2-1.

CR-2 Please provide a copy of an updated DPR form that records and discusses the present condition of the site and makes a recommendation regarding the eligibility of the resource to the California Register of Historical Resources, and submit a copy of this form to the appropriate CHRIS center.

Response: Response: A DRP form for the Highgrove Hydroelectric Plant is provided as Attachment CR2-1.

CR-3 Please provide a discussion of the location of the proposed gas line route in relation to any features of the old hydroelectric plant that may remain.

Response: The site of the former Highgrove Hydroelectric plant is located on the west side of Iowa Avenue, south of Spring Street. The only signs visible from the road way are a point-of-interest obelisk on the west side, and the intake for the Canal pipe under Iowa Street on the east. From the right-of-way looking west, the remnants of the iron penstock can be seen in an eroded gully. The penstock is below and to the south of the current piping conducting the canal under Iowa Avenue. Using the canal on the east side and the exposed pipes on the west engineers should be able to calculate the path of the pipes under Iowa Avenue. The penstock and canal pipes are perpendicular to the proposed gas line. On the east side of Iowa

Avenue they are just below grade. On the west side of Iowa Avenue the current canal pipe is about 5 feet below grade and the historic penstock is about 10 feet below grade. The location of the gas line in the street will not be determined until final design. However, construction will occur in such a manner as to avoid any damage to the historic penstock.

Photograph 1. Canal pipe (left) and historic penstock (right) emerging from under Iowa Avenue. Road surface visible at upper left. Camera facing east.

Photograph 2. Historic penstock exposed from road embankment, camera facing west.

ATTACHMENT CR2-1

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 5
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name or #** (Assigned by recorder) Highgrove Hydroelectric Plant

P1. Other Identifier: Highgrove Hydroelectric Plant

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Riverside
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Bernardino, South **Date** 1980 **T**____; **R** ____; ___ ¼ **of Sec** ____; _____ **B.M.**

c. Address South west of Iowa Avenue and Spring Street City Riverside Zip 92313

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN 247-083-003

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The current site contains three foundation walls built into an embankment. The foundations are about 12 feet deep and 30 feet along each wall. A series of piers continues to the west. The foundations and piers are constructed of random course rubble rock masonry. Traces of brick remain on top. The water line once used for providing motive power to the plant exits through the east foundation wall, where it hits a dragon's tooth to deflect and weaken the flow. The original penstock opening has been covered with concrete block along with an opening in the north wall. Near the top of the north and south walls niches for the structural beams are visible. East of the foundations water has exposed the original cast iron penstock along with the current canal pipe.

***P3b. Resource Attributes:** (List attributes and codes) HP9 Public Utility Building

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) Photograph 1. Camera facing east, November 14, 2006.

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1887

***P7. Owner and Address:**
City of Riverside
3900 Main St.
Riverside, CA 92522

***P8. Recorded by:** (Name, affiliation, address)
Cheryl Brookshear/ Rand Herbert
JRP Historical Consulting, LLC
1490 Drew Ave, Suite 110,
Davis, CA 95618

***P9. Date Recorded:** November 14, 2006

***P10. Survey Type:** (Describe)
Single Site

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") None

***Attachments:** ☐ None ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list) _____

***NRHP Status Code** 5

***Resource Name or #** (Assigned by recorder) Highgrove Hydroelectric Plant

B1. Historic Name: Highgrove Hydroelectric Plant
B2. Common Name: Highgrove Hydroelectric Plant
B3. Original Use: Power plant B4. Present Use: n/a
***B5. Architectural Style:** n/a
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1887, 1892 penstock improvements, 1900 change to alternating current system; building and equipment destroyed by fire in 1915.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:** _____
***B8. Related Features:** penstock; canal

B9. Architect: Gustavus O. Newman b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **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 Highgrove Hydroelectric Plant was previously recorded and accepted as a point of historical interest in 1968; the documentation for this designation, a one page sheet, it shown on a continuation sheet to this form. However, Highgrove Hydroelectric Plant site does not appear to be a historic resource for the purposes of CEQA. The power-plant's buildings and equipment burned to the ground in 1915. If the power-plant still existed as built, it would have been strongly associated with events that have made a significant contribution to the history of the local area, region or state (Criterion A and 1). The plant did embody characteristics of a type, period, region or method of construction, and could be considered to have high engineering value (Criterion C and 3). However, because the building burned in 1915, enough does not remain and does not have integrity to be a historical resource for the purposes of CEQA. The property does not appear to have been associated with a person who made significant contributions to local, state or national history (Criterion B and 2). Rarely buildings can provide information about historical methods of construction (Criterion D and 4), however, information on this building, including its original structure, is recorded elsewhere and it does not appear to be a primary source in this regard. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes) ____

***B12. References:** See footnotes.

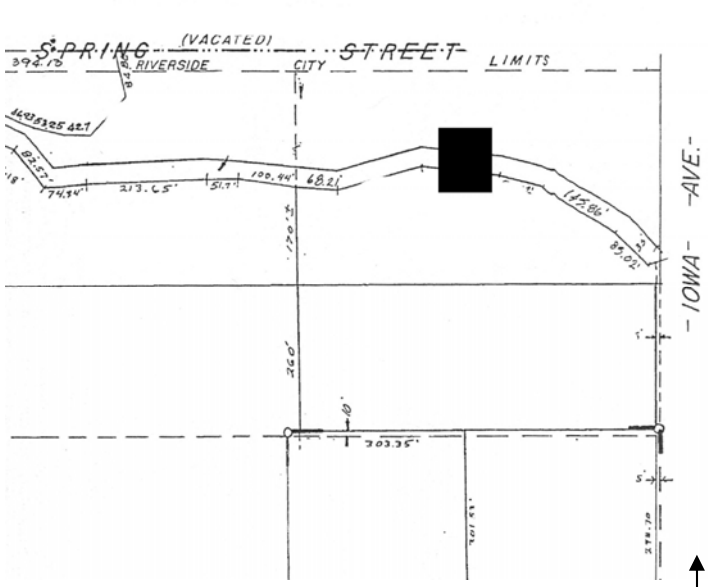
B13. Remarks:

***B14. Evaluator:** Cheryl Brookshear

***Date of Evaluation:** November 2006

(This space reserved for official comments.)

(Sketch Map with north arrow required.)



B10. Significance (continued):

This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to be a historical resource for the purposes of CEQA.

Historical Context

The development of the electric industry in California was an evolutionary process that dates as far back as 1879, the year in which California Electric Light Company began operation. This San Francisco-based company generated electricity, and distributed it to local subscribers from a central station.[1] This system was soon followed by electrical central stations in Los Angeles (1882), Visalia (1886) and Santa Barbara (1887). Most of these central stations were powered by steam converted from water through the burning of coal or wood, both costly commodities in California at the time. The cost was so high that the Visalia station and company quickly found itself in financial difficulties.[2]

While energy created from burning fuels was quite costly, hydropower – power created from the flow of water – was comparatively inexpensive and abundant. The Sierra Nevada provided an annual snow pack that melted throughout the spring and early summer, which in turn created numerous creeks, streams, and rivers that dropped rapidly from the mountains to the lower elevations. In the East, factories and electric plants used high volumes of water flow with low heads and benefited from year-round flow. California was geographically distinct and could use high heads and low volumes of flow usually along a watershed in the Sierra Nevada or Transverse Range. Reservoirs were also required to store water in the dry summer and fall seasons.[3]

The gold mining industry in many ways was the pioneering force in developing methods to tap high-head waterpower for a variety of purposes. As early as the 1850s, gold miners throughout the Sierra Nevada had devised complex water delivery systems consisting of wooden and iron pipes, ditches, damns, and flumes. One of the earliest uses of extensive water delivery and storage systems in the mines was for hydraulic mining, which used a high-pressure hose to wash away the surface layer of a hillside and expose the gold beneath. The hydraulic water cannon, invented in 1852, was later adapted by the hydroelectric industry as a way of turning tangential waterwheels. The ability to control the rate of water flow through a nozzle was also a hydraulic mining development that was later used in hydroelectric plants.

In 1879, the Excelsior Water and Mining Company became the first mining company to use electricity. The company used a water-driven Brush dynamo to supply power to three arc lights, thus doubling its production capacity because the mine could be worked throughout the night. This was a private enterprise though, and did not provide light to paying customers. In order for a company to provide power to customers, electricity was going to have to either be transmitted long distances or use low head and low flow sources found closer into the populated regions. Several people had experimented with hydroelectricity in these areas. George Chaffee built a small private hydroelectric plant on an irrigation canal near Etiwanda Colony in 1882. Peter Kehl also experimented with hydroelectricity placing a generator in his grist mill in the mid 1880s.[4] The first commercial hydroelectricity in California was not generated until 1887, to serve the Riverside area.

The Riverside Water Company provided Riverside and its environs with irrigation water. One of their canals, the Warm Water Canal, dropped 40 feet where the canal crossed Iowa Avenue just south of Spring Street. Charles R. Lloyd, who came

[1] William A. Myers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company* (Glendale, California: Trans-Anglo Books, 1983), 11.
[2] Myers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company*, 11-18.
[3] Caltrans and JRP Historical Consulting, *Water Conveyance Systems in California*. (Sacramento: Caltrans, 2000). 54-55.
[4] *Highgrove: Southern California's Pioneer Hydroelectric Power Plant* (Southern California Edison) 2.

from San Francisco, the home of California Electric Light, had the idea of using that drop to generate electricity. Lloyd's partner, described as "a man named Sinclair," negotiated a lease of the water power from Riverside Water Company for $250 per month.[5] Next, Sinclair appeared before the Riverside City Council in December of 1886 and, with the help of local banker O.T. Dyer secured a franchise to provide Riverside with street lighting.[6] Lloyd, Sinclair, Dyer and Frank Miller formed the San Bernardino Electric Light Company in January 1887. They hired Gustavus O. Newman, a Swedish-trained engineer to design the system.[7]

Newman designed a redwood flume to carry water to the chosen site. The water was then channeled into a cast iron penstock where it dropped to the bottom of the plant and turned three "simple" turbines. Each turbine shaft extended up into ground floor where gears and belts transferred the energy to three generators. After designing the plant, Newman stayed on to become the plant engineer and plant a grove of eucalyptus trees around the plant. By the spring of 1888, the direct current (DC) generators produced about 75 kW of electricity to light the streets of Riverside and Colton. A total of 30 arc lamps were lit from the system; 15 in Riverside and 15 in Colton. The system was expensive: Riverside paid $27.50 for its street lighting each month. In addition, the service was limited. Street lighting was provided from dusk until nine or midnight and no lighting was provided on nights with a full moon. Highgrove's operators also discovered that its turbine produced a loud whistle and the Warm Water Canal provided an intermittent water supply. Despite these problems, Highgrove and the company continued to develop. The San Bernardino Electric Light Company went on to build a second hydroelectric plant in San Bernardino in 1888, but quickly added a steam engine to power the generators.[8]

Financial difficulties forced Lloyd to reorganize the company in 1892 as the San Bernardino Electric Company. At that time Highgrove's wooden flume was replaced with an iron pipe, and other small improvements were made. Despite the improvements, the City of Riverside decided to build its own municipal power plant in 1895. Highgrove was able to continue operations providing power to surrounding areas. In 1898, it was also able to provide power to the new Riverside electric trolley. The company was again reorganized in 1900, and Highgrove was thoroughly modernized with new alternating current generators. Lloyd sold the company in 1903 to Henry E. Huntington's Pacific Light and Power Company. As a result, Highgrove became a part of the Riverside and San Bernardino trolley system. While its electrical output was low, it was an important switching point.[9]

On Sunday, March 28, 1915, a transformer overheated and exploded. The Highgrove power-plant burned to the ground, along with all its equipment and records. In 1917, Southern California Edison purchased Pacific Light and Power and used the Highgrove site as an electric switching station. The site was not fully abandoned until 1920.[10] Southern California Edison continued to pay the $250 for water power rights until 1952.[11]

Evaluation

The site of the Highgrove Hydroelectric Plant does not appear to be a historic resource for the purposes of CEQA. The power-plant, the first commercial hydroelectric plant in California, was associated with events that have made a significant contribution to the history of the local area, region or state (Criterion A and 1). While the owners of the building were of local importance, this site is not the most representative of their productive lives, as the Highgrove Hydroelectric Plant was one of several enterprises undertaken by them (Criterion B and 2). The building did embody significant type, period and

[5] Meyers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company*, 19.
[6] *Highgrove: Southern California's Pioneer Hydroelectric Power Plant*, 3;John Brown Jr., *History of San Bernardino and Riverside Counties Volume 3* (Western Historical Association, 1922) 4.
[7] *Highgrove: Southern California's Pioneer Hydroelectric Power Plant*, 3.
[8] Meyers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company*, 20-21; *Highgrove: Southern California's Pioneer Hydroelectric Power Plant*, 4-5.
[9] *Highgrove: Southern California's Pioneer Hydroelectric Power Plant*, 6-7.
[10] *Highgrove: Southern California's Pioneer Hydroelectric Power Plant*, 7-8.
[11] Meyers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company*, 20-21.

method of construction as an engineering work. (Criterion C and 3). Because of the 1915, fire not enough remains to yield important information (Criterion D and 4). The fire also severely damaged the integrity of the building in relation to design, workmanship, materials, feeling and association. The integrity has been so altered that even though the building was significant, its lack of integrity renders the building ineligible. The foundation remains do not convey sufficient significance because of this fact. Moreover, Southern California Edison has prepared a booklet memorializing the plant, which contains historic photographs and engineering drawings. The available information renders the remaining foundations less significant under Criterion D, as a source of information related to the history of early hydroelectric power engineering at this location. However, the site does qualify as a point of historical interest.

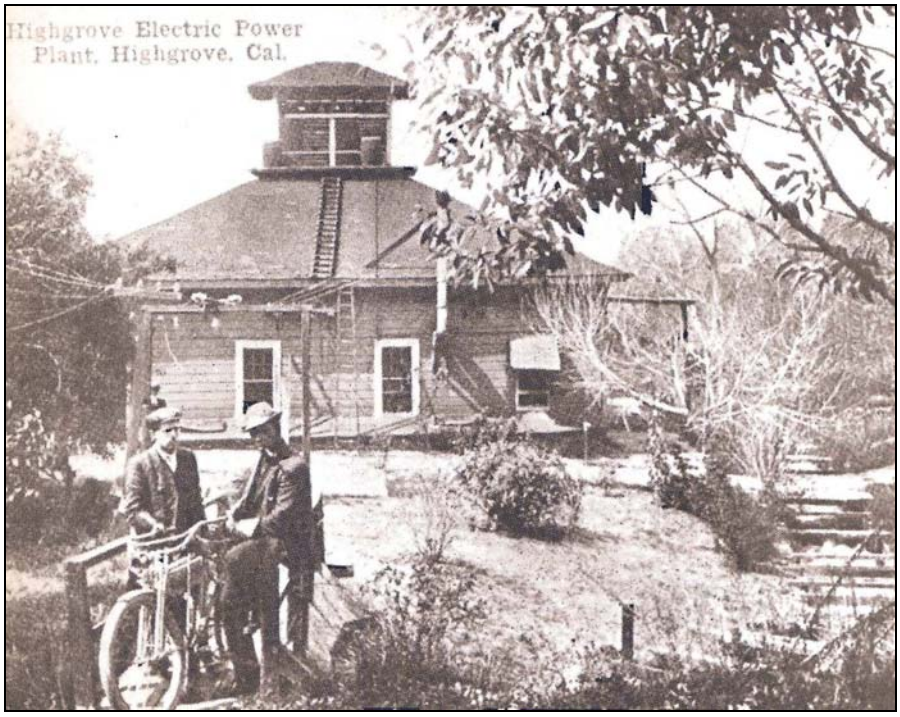
Photographs (cont):

Photograph 2. Foundations, camera facing northwest.

Photograph 3. Foundations, camera facing west.

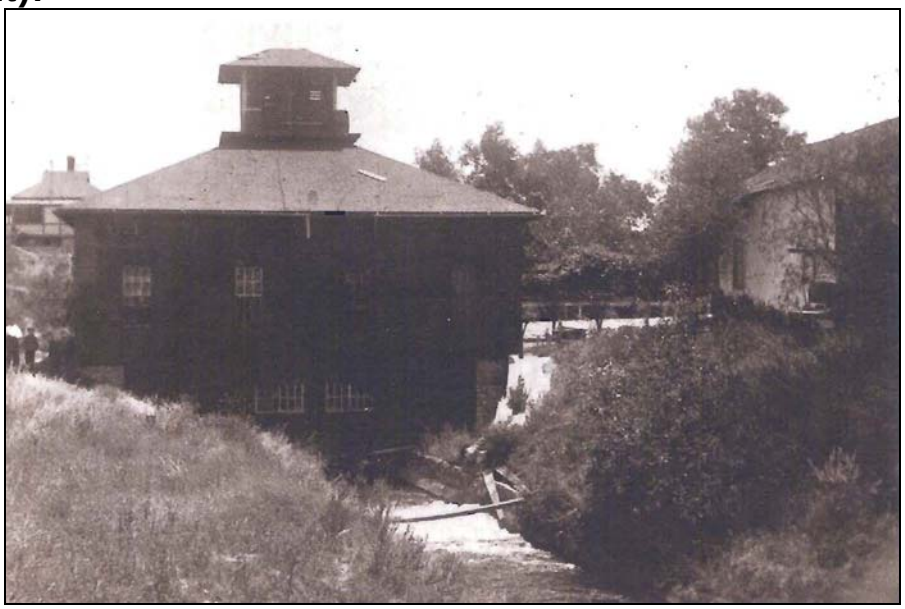
Photographs (cont):

Photograph 4. Penstock, camera facing west from above.

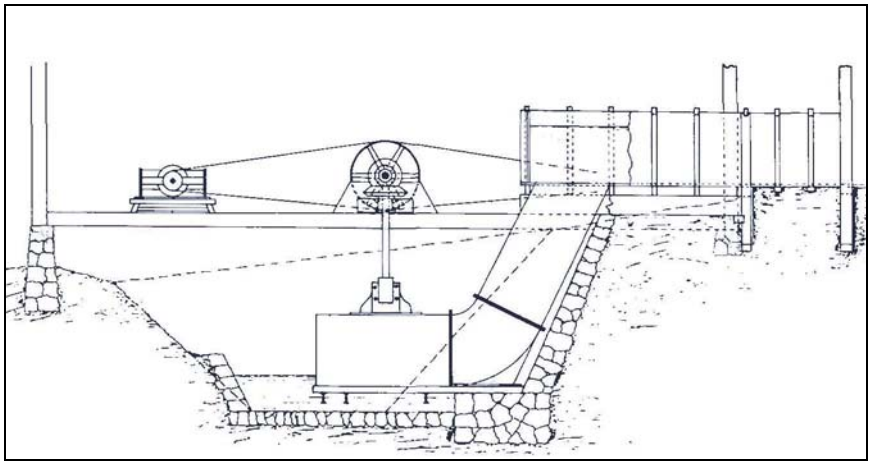


Photograph 5. Historic image of Highgrove Hydroelectric plant, facing east. *Highgrove: Southern California's Pioneer Hydroelectric Power Plant.*

Photographs (cont):



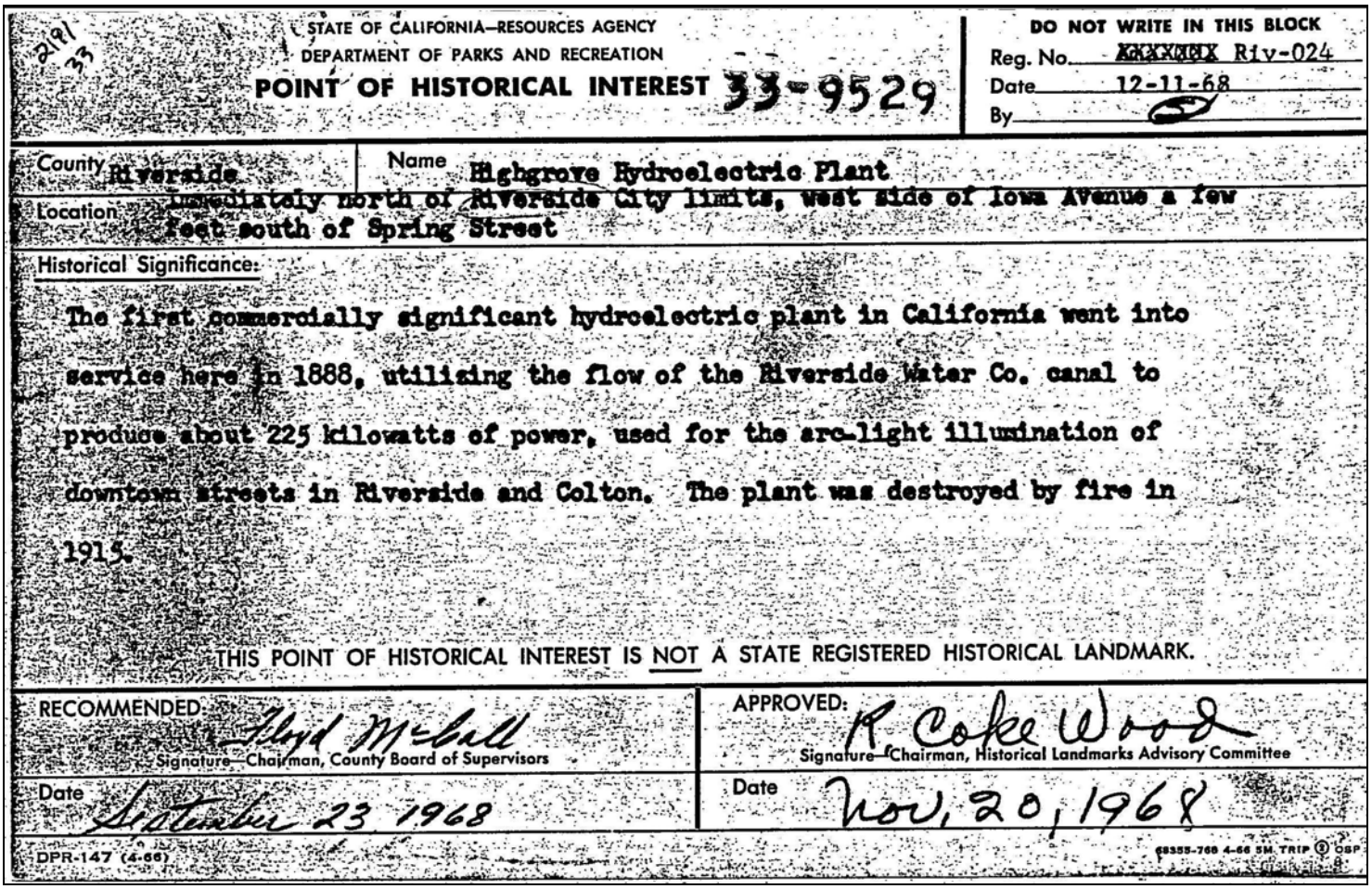
Photograph 6. Historic image of Highgrove Hydroelectric plant, facing west. *Highgrove: Southern California's Pioneer Hydroelectric Power Plant.*



Photograph 7. Diagram of Highgrove Hydroelectric Plant. *Highgrove: Southern California's Pioneer Hydroelectric Power Plant.*

Photographs (cont):

Photograph 8. G.O. Newman, plant engineer. *Highgrove: Southern California's Pioneer Hydroelectric Power Plant.*



STATE OF CALIFORNIA—RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION
POINT OF HISTORICAL INTEREST 33-9529

DO NOT WRITE IN THIS BLOCK
Reg. No. ~~XXXXXX~~ Riv-024
Date 12-11-68
By

County Riverside
Name Highgrove Hydroelectric Plant
Location Immediately north of Riverside City limits, west side of Iowa Avenue a few feet south of Spring Street

Historical Significance:

The first commercially significant hydroelectric plant in California went into service here in 1888, utilizing the flow of the Riverside Water Co. canal to produce about 225 kilowatts of power, used for the arc-light illumination of downtown streets in Riverside and Colton. The plant was destroyed by fire in 1915.

THIS POINT OF HISTORICAL INTEREST IS NOT A STATE REGISTERED HISTORICAL LANDMARK.

RECOMMENDED: Floyd McCall
Signature—Chairman, County Board of Supervisors
Date September 23 1968

APPROVED: R. Coke Wood
Signature—Chairman, Historical Landmarks Advisory Committee
Date Nov. 20, 1968

DPR-147 (4-66)

Figure 1. Existing Documentation on Highgrove Hydroelectric Plant.

AES HIGHGROVE PROJECT
(06-AFC-2)
INFORMAL DATA RESPONSES, SET 1A

Technical Area: Soil and Water Resources
Author: Michael Stephens

DATA REQUESTS

S&W-1 Please provide an alternative approach to the plant's water supply and wastewater disposal that does not rely solely on use of groundwater for the water supply and that minimizes truck transport of wastewater.

Response: At the Data Response Workshop, representatives of AES, CEC Staff, Riverside Canal Water Company, the City of Grand Terrace, and the San Bernardino County Water Master representative participated in a round table discussion to evaluate water supply sources with the potential to reduce or eliminate the use of onsite well water for cooling. The potential sources identified at the workshop included the Spring Street nitrate impacted well water, the Riverside Canal water, and the Gage Canal water. It was well understood that modification to the water supply source likely affects the quality of the wastewater generated and therefore the volume and quality of water discharge. Based on the ideas discussed at the workshop, AES has proceeded to conduct engineering analyses of each potential alternative water source to further evaluate the alternative sources identified. The objectives of the evaluation were:

- Reduce to the extent feasible the use of onsite well water for cooling
- Maximize to the extent feasible the use of an impaired or degraded water source
- Reduce to the extent feasible the concept of trucking wastewater offsite for disposal

As discussed below, we believe that a combination of the Spring Street nitrate-impacted well water and the on-site well water is the alternative that best meets all of the objectives.

Evaluation Methodology/Background

As discussed in the workshop, AES obtained water quality analyses for both the Spring Street wells, located approximately 1.5 miles from the site, and the Riverside Canal, located next to the proposed plant's western boundary.

The Spring Street wells are considered an impaired water source due to nitrate contamination, which makes the wells unsuitable for potable use. As discussed at the workshop, pumping water from these wells will offer a benefit to the region by cleaning up the aquifer such that it may be available as a source of potable water in the future. Water quality from the Spring St wells is characterized as high in nitrates, total dissolved solids (TDS), hardness, and conductivity. Other considerations associated with this option include the need to construct a pipeline

approximately 1.5 miles in length to convey water from the Spring Street well pipeline to the site. However, the full length of the pipeline can be constructed in the public right-of-way.

The Riverside Canal, which is owned and operated by the City of Riverside, is used to supply water for agricultural use to downstream users. The water is classified as nonpotable since it is carried in an open canal. According to the City of Riverside, the source of water for the Canal is from upstream wells. Many of the wells are unacceptable for potable use because they were not constructed to potable standards; and/or they are located near the Santa Ana River and, therefore, potentially under the influence of surface water. The water quality analysis used in the evaluation was provided by the City as representative of the various sources, which pump into the Canal. The water quality can be characterized as generally low in TDS (about half that of TDS levels in the Spring Street wells), but high in certain metals (manganese and iron), which tend to create scaling problems in cooling towers. Additional considerations in the evaluation were to minimize impacts to downstream users of the Riverside Canal. The downstream users rely on the Riverside Canal nonpotable water to be delivered to them for agricultural use. Our understanding is that any withdrawal from the Riverside Canal would require adding another source of water back to the Canal to ensure that the downstream users are not impacted.

AES was also requested to consider use of Gage Canal as a nonpotable water source. The Gage Canal is located approximately 0.5 to 1 mile north of the project site. Riverside has indicated that use of Gage Canal water is not preferable, as they intend to convert total Gage production to domestic water in the future. Therefore, use of the Gage Canal as a potential water source has not been further considered.

In Data Response Nos. 19c and 58, AES addressed the infeasibility of an onsite zero-liquid discharge system for this project and construction of a new pipeline to the Santa Ana Regional Interceptor (SARI) line. Additionally, AES conducted an extensive evaluation of reclaimed water sources in the Alternatives Section (Section 9) of the AFC.

Evaporative Cooling Process/Cycles of Concentration

Increasing the cycles of concentration is highly desirable because it reduces consumptive water use while also reducing the volume of the waste stream. The quality of source water is an important consideration in plant design since it can affect the metallurgy chosen for plant cooling components, the degree to which the water can be recycled or "concentrated" in the cooling tower to conserve use, and the quantity and quality of the wastewater discharge. The water quality analyses used for the Spring Street wells and Riverside Canal is presented in Attachment S&W-1A.

Water is typically recirculated in a cooling tower to the maximum extent possible. During every cycle through the tower, a portion of water is evaporated to achieve cooling; thereby, concentrating the constituents in the water that remains. Increasing the "cycles of concentration" increases the concentration of contaminates in the cooling water, raising scaling and fouling potential inside the cooling tower and levels of the constituents in the disposal or "blowdown" stream. Maximizing the cycles of concentration (COC) within these constraints is desirable to reduce cooling tower blowdown (and therefore the quantity of wastewater that must be disposed), thus minimizing water consumption.

In the evaluation of various water sources, the WaterCycle RxTM software program was employed to calculate the water quality and maximize cycles of concentration for the disposal options under consideration. Based on the desire to avoid trucking of wastewater to the SARI wastewater line, the analysis focused on the following two disposal options:

(1) discharging process wastewater into the Riverside Canal; and

(2) discharging wastewater to the existing sewer main, which is located in Taylor Street adjacent to the plant.

Following is a discussion of the discharge options reviewed and the impact of each option on the analysis.

Discharge to Riverside Canal. A consideration for discharging water to the Riverside Canal is the potential impact to downstream users. The water in the Canal is used downstream for crop irrigation; therefore, the level of TDS in the discharge (or salts) is a primary limitation. For the purpose of the analysis, it was assumed that the TDS level of the effluent to the canal cannot exceed 2 to 3 times the canal TDS, which on average is 249 mg/L. This assumption limits the wastewater discharge to a TDS of 750 ppm, which is approximately equal to the TDS in the Spring Street well water (~720 mg/L).

Colton Waste Water Treat Plant (CWWTP). The City of Grand Terrace has a Joint Powers Agreement with the City of Colton to treat waste from Grand Terrace. AES has preliminarily confirmed that CWWTP has adequate capacity to treat process waste from the plant. The plant discharge would be required to meet TDS limits of 1100 ppm and conductivity of 1700 micromhos (µmhos).

Analysis of Riverside Canal Options

As mentioned earlier, water from Riverside Canal contains high manganese and potential iron contamination that cause scaling problems in cooling towers. Thus, to use water from the Canal, extensive pre-treatment systems would be required such as coagulation and filtration, lime softening, and cation exchange. This type of pretreatment system requires a significant capital expenditure for the small

volume of water being treated and also requires a significant amount of space on the site.

Although space on the site is extremely limited and the cost of installing the pretreatment system for manganese and iron is high, AES evaluated the following options associated with the use of water from the Riverside Canal:

- "Once-through" type cooling, where water would be not be recirculated in the towers to avoid concentrating TDS levels and impacting downstream agricultural users;
- Using Riverside Canal water to meet 100 percent of the plant's needs; and
- Blending Riverside Canal water with onsite well water to reduce wastewater discharge volumes.

Once-Through Cooling. With a once-through cooling option, TDS levels would not be increased and the all the water would be returned to the canal to avoid impacting downstream users. The water would be returned to the canal at a higher temperature. (Because permits for the former plant did not limit discharge temperature since there is no aquatic life in the Canal, it was assumed at this point that discharge temperature was not a major factor in the analysis.) Because the gas turbine intercooler requires a cooling water flow of 7,000 gpm (for each of the three gas turbines), the total volume of water from the Canal required for this option would be approximately 21,000 gpm. It is questionable whether the Riverside Canal could reliably provide this large flow during peak operating times. Since such a large amount of water is needed for this option, it is infeasible to construct adequate onsite storage for this case. Therefore, if canal flow was disrupted, the project would have to shut down.

100 Percent Riverside Canal Water. Use of 100 percent Riverside Canal water would result in total water consumption for plant cooling systems of 1,022 gpm. Compared to the original proposal to use onsite wells, this option represents an increase in total plant cooling water needs of 137 percent water (or an increase from 431 gpm to 1,022 gpm). Water consumption increases since, even with pre-treatment of Riverside Canal water (in the form of coagulation and filtration, lime softening, and/or cation exchange systems), the maximum cycles of concentration that can be achieved is 1.65 cycles. Conductivity and TDS are the limiting factors affecting the cycles of concentration. Because this option would increase TDS levels to 1,048 ppm, it was assumed that the water could not be discharged to the Riverside Canal. Thus, discharge limits are established based on CWWTP limits. Additionally, the water used from the canal would need to be replaced to avoid impacts to downstream users. Therefore, total plant water consumption associated with both uses and replacement would increase.

50/50 Ratio of Riverside Canal/Onsite Well. A case was evaluated to examine if blending Riverside Canal water with onsite well water would result in a better

optimization of plant water consumption and discharge water volumes and quality. With this option, pretreatment of Riverside Canal water is still required. Blending Riverside Canal water with onsite well water in a 50/50 blend only allows an increase in COC to 2.0 with a corresponding reduction in water consumption from 1,283 gpm to 1,125 gpm. For this blended case, conductivity and sulfate are the limiting constituents. Since this option increases use of onsite well water for cooling relative to AES' original proposal, from 431 gpm to 563 gpm (or 50 percent of 1,125 gpm), this option was rejected from further analysis. Analysis of further blending options will increase onsite well use and yield only minimal increases in cycles of concentration. Additionally, the water used from the canal would need to be replaced to avoid impacts to downstream users.

Conclusions for Use of Riverside Canal Water Options. Once-through cooling was rejected because the volume of water necessary to support peak operations would place too high a risk on the project from canal disruptions or guaranteed water flows, especially given that size of the site is inadequate to support the large volume of backup storage that would be needed.

The other options evaluated were also rejected because all cases result in the use of more onsite well water than in the original proposal for using onsite wells. In all cases, water from an additional sources would be needed to replace water used from the canal to avoid impacts to downstream agricultural users. Additionally, due to the quality of the water in the Riverside Canal, the water would need to be treated prior to use even if blended with the better quality onsite well water. The site is inadequately sized to support installation of the pretreatment equipment. It also imposes a significant and uneconomical cost burden to this peaking project.

TABLE S&W1-1.
Riverside Canal Water Options

	Current AFC 100% Site Well	100% Canal Water, Once-Through	50% Canal Water 50% Site Well	100% Canal Water
Discharge	**SARI**	**Sewer**	**Sewer**	**Sewer**
Cycles of Concentration	6.5	0	2	1.6
Onsite Well Use				
gpm	737	0	563	-
acre-ft/yr	357	0	272	-
Riverside Canal Water Use				
gpm	-	0	563	1328
acre-ft/yr	-	0	272	643
Cooling Tower Makeup				
gpm	431	0	819	1022
acre-ft/yr	209	0	396	495
Total Plant Makeup				
gpm	737	0	1125	1328
acre-ft/yr	357	0	544	643
Water make-up from Alternate Source				
gpm	-	0	563	1328
acre-ft/yr	-	0	272	643
Discharge				
gpm	86	0	476	679
acre-ft/yr	42	0	230	329
% Increase or Decrease in Onsite Well Use	**Base**	**-100%**	**-24%**	**-100%**
% Increase or Decrease in Discharge Volume	**Base**	**-100%**	**453%**	**690%**

Notes:
1. At Annual Average conditions (80°F, 60% RH)
2. Based on maximum annual capacity factor of 30%

Analysis of Spring Street Well Water Options

As described previously in Data Response No. 48 (Set 1A), the water from the Spring Street wells is considered impaired due to nitrate levels in excess of drinking water standards. Elevated nitrate levels in groundwater result from activities such as crop fertilization and septic systems, which were prevalent in the region at one time. Methods used to make nitrate-impaired water from aquifers suitable for potable water supply include blending with higher water quality supplies, removing and using the water in nonpotable systems such as irrigation, and installing water treatment equipment that remove nitrates. Water treatment systems that remove nitrates include reverse osmosis and ion exchange systems, which are generally considered to be costly remediation options. In addition, these water treatment processes create a concentrated brine that requires disposal. As discussed at the workshop, removal of the Spring Street water for use by the proposed project would provide a regional benefit since other methods of cleanup are less economical.

The Spring Street wells are high in nitrates, TDS, hardness, and conductivity. TDS levels in the combined stream from wells #21 and #22 are approximately twice as high (720 mg/L) as that in the onsite wells and the Riverside Canal. Therefore, using Spring Street water in a once-through system and discharging it into the Riverside Canal or the sewer is not feasible. If the cooling tower blowdown is to be discharged to the sewer, the Spring Street well water only becomes usable if blended with onsite well water, with a minimum of 25 percent onsite well water. Further, for every 25 percent of onsite well water used, the wastewater volume to the sewer is reduced by approximately 500 gpm.

AES, therefore, focused on options where water from the Spring Street wells is blended with onsite well water in different proportions. The following cases were assessed:

- Blend of 25 percent Spring Street water and 75 percent onsite well water
- Blend of 50 percent Spring Street water and 50 percent onsite well water
- Blend of 75 percent Spring Street water and 25 percent onsite well water

As shown in Table S&W1-2, because cycles of concentration are limited, the only option that reduces use of onsite well water compared to the current AFC case of 100 percent onsite well water, is the option consisting of a blend of 75 percent Spring Street water and 25 percent onsite well water. While this option reduces onsite well use by 25 percent, water discharge volume increases significantly, from 86 gpm to 1,582 gpm.

TABLE S&W1-2
Spring Street Well Options

	Current AFC			
	100% Site Well	25% Spring St 75% Site Well	50% Spring St 50% Site Well	75% Spring St 25% Site Well
Discharge	**SARI**	**Sewer**	**Sewer**	**Sewer**
Cycles of Concentration	6.5	2	1.5	1.3
Onsite Well Use				
gpm	737	844	800	558
acre-ft/yr	357	408	387	270
Spring Street Well Use				
gpm	-	281	800	1673
acre-ft/yr	-	136	387	810
Cooling Tower Makeup				
gpm	431	819	1293	1925
acre-ft/yr	209	396	626	932
Total Plant Makeup				
gpm	737	1125	1599	2231
acre-ft/yr	357	544	774	1080
Discharge				
gpm	86	476	948	1582
acre-ft/yr	42	230	459	766
% Increase or Decrease in Onsite Well Use	**Base**	**14%**	**8%**	**-24%**
% Increase or Decrease in Discharge Volume	**Base**	**453%**	**1002%**	**1740%**

Notes:
1. At Annual Average conditions (80°F, 60% RH)
2. Based on maximum annual capacity factor of 30%

Additional Wastewater Treatment System

Because discharge volume increases significantly for these cases, AES investigated options to reduce cooling tower blowdown. The addition of a wastewater treatment system allows the cycles of concentration to be increased in the cooling tower and, thus, reduces both discharge volumes as well as cooling tower makeup and, hence, total plant water consumption. The addition of this system (which consists of a "saltwater" RO treatment system, a multi-media filter, a caustic injection system and lime softener) reduces discharge volume to the sewer from 948 to 95 gpm and reduces onsite well consumption by 50 percent. The drawback of this alternate is that a small stream of RO reject (22 gpm) is generated by the wastewater treatment system. The RO reject, which has significantly higher TDS and conductivity, must be stored onsite and then trucked offsite to the SARI line. However, the number of trucks required during a "worst case" operating day would be approximately three. This represents a significant decrease in trucking from the case originally proposed in the AFC.

The effects of the wastewater treatment system on water consumption and discharge are illustrated in Table S&W1-3.

TABLE S&W1-3
Wastewater Treatment System Effects on Water Consumption and Discharge

	Current AFC		
	100% Site Well	50% Spring St 50% Site Well	50% Spring St 50% Site Well
Discharge	SARI	No Treatment	With Addition of Wastewater Treatment System
Cycles of Concentration	6.5	1.5	5.5
Onsite Well Use			
gpm	737	800	378
acre-ft/yr	357	387	183
Spring Street Well Use			
gpm	-	800	378
acre-ft/yr	-	387	183
Cooling Tower Makeup			
gpm	431	1293	450
acre-ft/yr	209	626	218
Total Plant Makeup			
gpm	737	1599	756
acre-ft/yr	357	774	366
Discharge to Sewer			
gpm	86	948	95
acre-ft/yr	42	459	46
Discharge to SARI Line			
gpm	88	-	22
No. trucks per day (6700/gal/truck)[7]	12	-	3
% Increase or Decrease in Onsite Well Use	**Base**	**8%**	**-49%**
% Increase or Decrease in Discharge Volume	**Base**	**1002%**	**11%**

Notes:
1. At Annual Average conditions (80°F, 60% RH)
2. Based on maximum annual capacity factor of 30%
3. At "worst-case" 15-hour operating day

The effects of adding a wastewater treatment system to a water source consisting of a blend of 75 percent Spring Street water and 25 percent onsite well water was also investigated, but rejected. Due to the poorer water quality, the RO reject for this option increases and therefore increases the number of trucks required to truck wastewater to the SARI line from three to four.

Summary

Based on this review we have determined that a 50/50 blend of Spring Street and onsite wells in conjunction with a wastewater treatment system and combination of sewer discharge and minimized wastewater trucking will most economically:

- Reduce onsite well water use for plant cooling by 49 percent
- Provide a regional benefit by using impaired water for plant cooling

- Reduce the average number of wastewater trucks per day by 75 percent[1]

With this option, a total of 450 gpm would be required for plant cooling systems (make-up for cooling tower water evaporation and blowdown). Approximately 84 percent of plant cooling needs (378 gpm/450 gpm) would be provided by the Spring Street wells. The remaining onsite well water will be used for demineralized water for NO_x injection, gas turbine evaporative cooling, and other plant uses.

S&W-2 Please identify the location of the all water crossings and permits required.

Response: As shown in Figure S&W2-1, there are five crossings where the gas line would cross surface water features. Where trenchless construction is used (e.g., horizontal directional drilling, or jack and bore) only a Streambed Alteration Agreement with the California Department of Fish and Game would be required. Where trenching is used, 401 and 404 permits are required along with the Streambed Alteration Agreement.

[1] Three trucks per day compared to 12 trucks per day based on 15 hours per day at the annual average operating temperature of 80 °F.

AES HIGHGROVE PROJECT
(06-AFC-2)
INFORMAL DATA RESPONSES, SET 1A

ATTACHMENT S&W-1A

Water Composition and Discharge Limits

Constituent	Units	Spring St Well #21[a]	Riverside Canal (Blended)[b]	Colton WWTP Industrial User Discharge Limit[c]
Date Reported		7/6/2006	2000- present	
Arsenic, Total	mg/L	0	0.113	0.12
Barium, Total	mg/L	0.11		43
Boron, Total	mg/L			7.4
Cadmium, Total	mg/L	0		0.05
Cobalt, Total	mg/L			9.5
Copper, Total	mg/L	0		2.1
Cyanide	mg/L	0		3.1
Fluoride, Total	mg/L	0		6
Hardness, Total (as $CaCO_3$)	mg/L	410	142	600
Iron, Total	mg/L	0	<100	20
Lead, Total	mg/L	0		0.37
Manganese, Total	mg/L	0	0.076	2
Nickel, Total	mg/L	0		0.6
Nitrogen, Total Inorganic	mg/L	20	1	27
BOD	mg/L	11		230
Selenium, Total	mg/L			0.1
Silver, Total	mg/L	0		0.9
TSS	mg/L	0		220
TDS	mg/L	790	249	1100
Zinc, Total	mg/L	0	0.05	3.9
Hexavalent Chromium	mg/L	0		0.4
Sodium	mg/L	110	35	306
Chloride	mg/L	94	20	258
Cyanide	mg/L	0		3.1
Sulfate	mg/L	93	51	300
Specific Conductance	µmhos/cm	1200	420	1700

Sources:
[a] Test America water analysis, dated 7/10/2006
[b] Information from City of Riverside, dated 11/3/2006
[c] Information provided by G. Ethridge, 12/1/2006

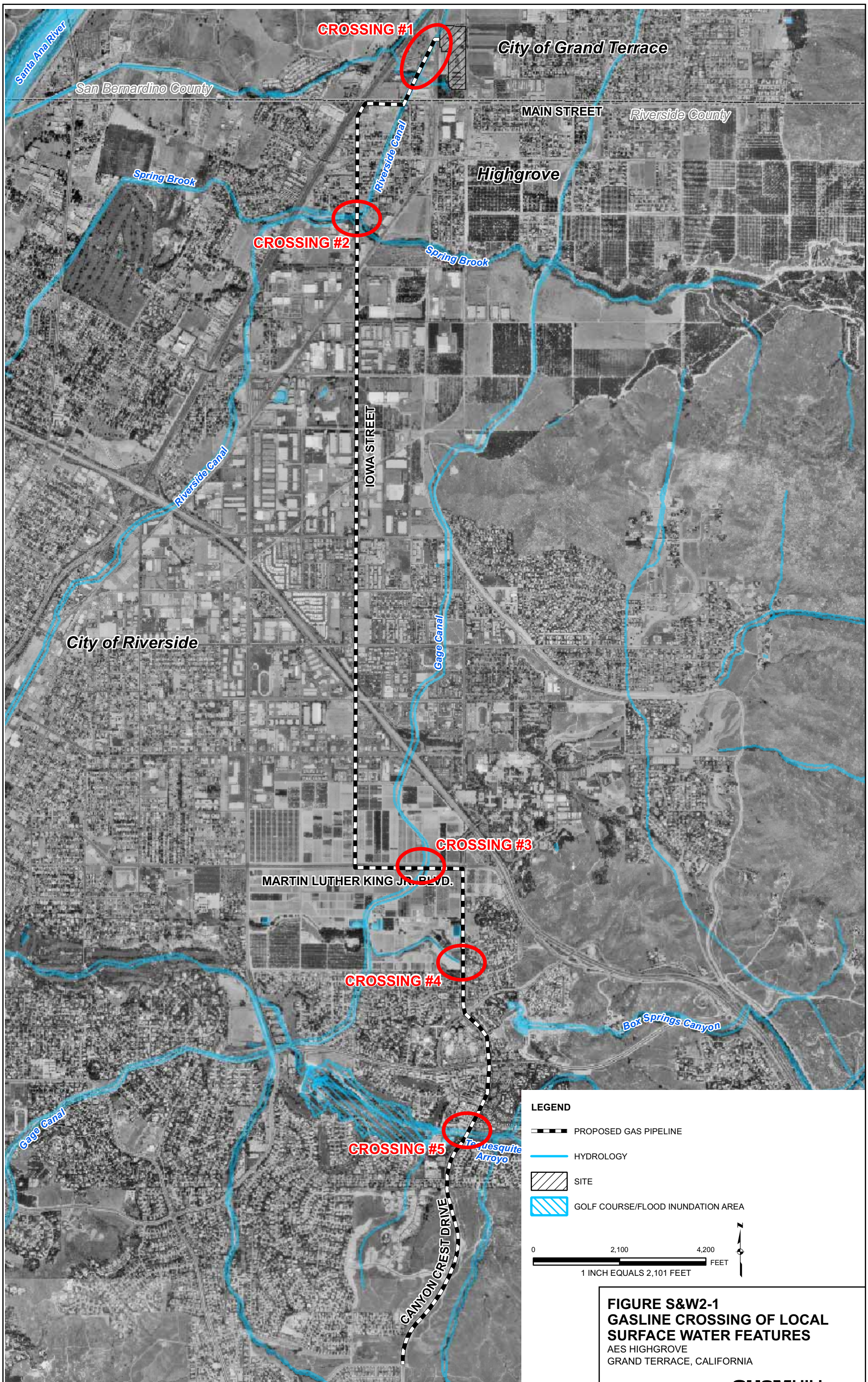


FIGURE S&W2-1
GASLINE CROSSING OF LOCAL SURFACE WATER FEATURES
AES HIGHGROVE
GRAND TERRACE, CALIFORNIA

CH2MHILL

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AES HIGHGROVE PROJECT
(06-AFC-2)
INFORMAL DATA RESPONSES, SET 1A

Technical Area: Waste Management
Author: Ellie Townsend-Hough

BACKGROUND

The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) is working with the Southern California Edison Company (SCE) on the investigation and remediation of the toxic contaminants that may remain in the soil of the detention basins at the former SCE Highgrove Generating Station. Energy Commission staff discussed the HP and the site's remediation status with Jose Kou, P.E., Chief, Southern California Permitting and Corrective Action Branch of the Department of Toxic Substances Control (DTSC). Currently SCE is working under a Stipulation Order to remediate the site. DTSC has been approached by the AES Company to oversee the corrective action at the parcels of the facility where the existing power plant is located and the location of the future power plant. DTSC has started drafting a corrective action consent agreement that will be negotiated with AES for the oversight activities on the HP site.

Also, a Closure Demonstration Report certifying clean closure of several hazardous waste management areas at the former Highgrove Generating Station is being prepared by SCE, for submittal to DTSC.

DATA REQUEST

WM-2 Please provide the CEC with a copy of the signed consent agreement.

Response: The Consent Agreement is provided as Attachment WM-2A.

WM-3 Please provide a copy of the Work Plan once it is approved by DTSC.

Response: Since the workshop, meetings and an additional site visit have been held with DTSC to develop a Work Plan that both parties can agree to. A copy of the Work Plan will be provided once it is finalized.

WM-4 Please provide a status on the Work Plan and the investigation work in AES' monthly status report.

Response: The status of the Work Plan will be provided in AES' monthly status report.

ATTACHMENT WM-2A

STATE OF CALIFORNIA
ENVIRONMENTAL PROTECTION AGENCY
DEPARTMENT OF TOXIC SUBSTANCES CONTROL

In the Matter of: Riverside Canal Power Company (Former Southern California Edison Highgrove Generating Station) 12700 Taylor Street City of Grand Terrace, California EPA ID No. CAL000181154	Docket No. HWCA P3-06/07-003 CORRECTIVE ACTION CONSENT AGREEMENT Health and Safety Code Section 25187

INTRODUCTION

1. The Department of Toxic Substances Control (DTSC) and Riverside Canal Power Company (Respondent), a wholly owned subsidiary of The AES Corporation, enter into this Corrective Action Consent Agreement (Consent Agreement) and agree as follows:

1.1. Jurisdiction exists pursuant to Health and Safety Code section 25187, which authorizes DTSC to issue an order to require corrective action when DTSC determines that there is or may be a release of hazardous waste or hazardous waste constituents into the environment from a hazardous waste facility.

1.2. The parties enter into this Consent Agreement to avoid the expense of litigation and to carry out promptly the corrective action described below.

1.3. Respondent is the owner and/or operator of a portion of the former Southern California Edison, Highgrove Generating Station, located at 12700 Taylor Street, City of Grand Terrace, San Bernardino County (Facility), identified as Assessor's parcel No. 1167-151-67-000.

1.4. Southern California Edison engaged in the management of hazardous waste pursuant to a 1995 Final Judgment Pursuant to Stipulation.

1.5. The terms used in this Consent Agreement are as defined in California Code of Regulations, title 22, section 66260.10, except as otherwise provided.

1.6. Respondent agrees to undertake all actions required by the terms and conditions of this Consent Agreement, including any portions of this Consent Agreement incorporated by reference.

1.7. Respondent waives any right to request a hearing on this Consent Agreement pursuant to Health and Safety Code section 25187.

1.8. By entering into this Consent Agreement, Respondent does not admit to any liability for any release of hazardous waste or hazardous waste constituents into the environment at or from the Facility.

FINDINGS OF FACT

2.1. Based on the Application for Certification, AES Highgrove Project, dated May 2006 (Docket No. 06-AFC-2), submitted to California Energy Commission, DTSC concludes that further investigation is needed to determine the nature and extent of any release of hazardous waste or hazardous waste constituents at the project site.

2.2. The hazardous waste and hazardous waste constituents that Respondent plans to investigate at the Facility include metals, volatile organic compounds, semi-organic compounds, total petroleum hydrocarbons, and polychlorinated biphenyls.

2.3. Hazardous wastes or hazardous waste constituents have migrated or may migrate from the Facility into the environment through the following pathways: soil, vadose zone, surface water and groundwater.

PROJECT COORDINATOR

3. DTSC and Respondent have each designated a Project Coordinator. DTSC's Project Coordinator is Chia Rin Yen. Respondent's Project Coordinator is Julie Way, and Craig O'Rourke of Terracon will act as her back-up. Each Project Coordinator shall be responsible for overseeing the implementation of this Consent Agreement and for designating a person to act in his/her absence. All communications between Respondent and DTSC, and all documents, report approvals, and other correspondence concerning the activities performed pursuant to this Consent Agreement shall be directed through the Project Coordinators. Each party may change its Project Coordinator with at least seven days prior written notice.

WORK TO BE PERFORMED

4.1. Respondent agrees to perform the work required by this Consent Agreement in accordance with the applicable state and federal laws, their implementing regulations, and the applicable DTSC and the United States Environmental Protection Agency (USEPA) guidance documents.

RCRA FACILITY ASSESSMENT (RFA)

5.1. Within 30 days of the effective date of this Consent Agreement, Respondent shall submit a RCRA Facility Assessment (RFA) to identify all solid waste management units (SWMUs) and areas of concern (AOCs) that either have released or may release hazardous waste or hazardous waste constituents into the environment. The RFA shall 1) identify all potential releases of concern; 2) identify all SWMUs and/or AOCs; 3) determine which areas need further investigation; 4) determine which areas require interim measures; and 5) screen out releases that do not require any further investigation. The RFA shall be prepared consistent with the USEPA guidance document for RFA dated 1986.

5.2. The scope of the RFA is limited to parcels identified in the Map attached as Exhibit A which contains (1) parcels on the so-called Generating Station Property and the so-called Cage Park Property (Assessor's Parcel No. 1167-151-67-000) that

are currently owned by Respondent, and (2) parcels on the so-called North Property and the so-called Tank Farm Property (Assessor's Parcel No. 1167-151-63-1000) that are currently owned by the City of Grand Terrace.

RCRA FACILITY INVESTIGATION (RFI)

6.1. Within 60 days of the effective date of this Consent Agreement, Respondent shall submit to DTSC a Current Conditions Report and a Workplan for a RCRA Facility Investigation ("RFI Workplan"). The Current Conditions Report shall contain an assessment of interim measures. The assessment must include both previously implemented interim measures and other interim measures that could be implemented at the Facility. The assessment must also identify any additional data needed for making decisions on interim measures. This new data or information shall be collected during the early stages of the RCRA Facility Investigation. The Current Conditions Report and RFI Workplan are subject to approval by DTSC and shall be developed in a manner consistent with, and to the extent applicable, the Scope of Work for a RCRA Facility Investigation contained in Attachment 1. DTSC will review the Current Conditions Report and RFI Workplan and notify Respondent in writing of DTSC's approval or disapproval.

6.2. The RFI Workplan shall detail the methodology to: (1) gather data needed to make decisions on interim measures/ stabilization during the early phases of the RCRA Facility Investigation; (2) identify and characterize all sources of contamination; (3) define the nature, degree and extent of contamination; (4) define the rate of movement and direction of contamination flow; (5) characterize the potential pathways of contaminant migration; (6) identify actual or potential human and/or ecological receptors; and (7) support development of alternatives from which a corrective measure will be selected by DTSC. A specific schedule for implementation of all activities shall be included in the RFI Workplan.

6.3. Concurrent with the submission of a RFI Workplan, Respondent shall submit to DTSC a Health and Safety Plan in accordance with Attachment 2.

6.4. Concurrent with the submission of a RFI Workplan, Respondent shall submit to DTSC for approval a Community Profile in accordance with Attachment 3. Based on the information provided in the Community Profile and any Supplement to the Community Profile, if DTSC determines that there is a high level of community concern about the Facility, Respondent shall prepare a Public Participation Plan.

COMBINED SUBMITTAL OPTION

7. DTSC recognizes that Respondent may want to expedite the document submittal process, and DTSC is willing to allow an expedited submittal process for certain documents. Accordingly, Respondent shall have the option (but not the requirement) to combine multiple elements of the RFA, the Current Conditions Report and/or the RFI Workplan into one submittal. If Respondent chooses this option, Respondent shall so notify DTSC in writing within 15 days of the effective date of this Consent Agreement, and thereafter DTSC and Respondent shall mutually agree upon a table of contents which shall detail the elements and scope of the combined document. If Respondent chooses this option, the combined document shall contain all the

applicable elements from the USEPA guidance document for RFA dated 1986, and Attachments 1,2, and 3, but need not adhere to the specific format of such guidance document or Attachments. Respondent shall submit the combined document to DTSC within 60 days of the effective date of this Consent Agreement.

IMPLEMENTATION OF RFI WORKPLAN AND OTHER PHASES OF CORRECTIVE ACTION WORK

8. For the implementation of RFI Workplan and/or if it becomes necessary to perform other phase(s) of corrective action work, DTSC and Respondent will negotiate another consent agreement or amend this Consent Agreement to address the additional work. If another consent agreement or an amendment is not reached within 60 days after notification to the Respondent by DTSC that a new consent agreement or amendment to this Consent Agreement is necessary, DTSC reserves its right to issue an order or take any other action provided for by law. DTSC's costs incurred in negotiating the subsequent consent agreement or the amendment are considered costs incurred pursuant to this Consent Agreement and are payable under this Consent Agreement.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

9.. DTSC must comply with the California Environmental Quality Act (CEQA) insofar as activities required by this Consent Agreement are projects subject to CEQA. Respondent shall provide all information necessary to facilitate any CEQA analysis. DTSC will make an initial determination regarding the applicability of CEQA. If the activities are not exempt from CEQA, DTSC will conduct an Initial Study. Based on the results of the Initial Study, DTSC will determine if a Negative Declaration or an Environmental Impact Report (EIR) should be prepared. DTSC will prepare and process any such Negative Declaration. However, should DTSC determine that an EIR is necessary, such an EIR would be prepared under a separate agreement between DTSC and Respondent.

DTSC APPROVAL

10.1. Respondent shall revise any workplan, report, specification, or schedule in accordance with DTSC's written comments. Respondent shall submit to DTSC any revised documents by the due date specified by DTSC. Revised submittals are subject to DTSC's approval or disapproval.

10.2. DTSC shall use its best efforts to review any workplan, report, specification, or schedule submitted by Respondent and provide written comments to Respondent in a timely manner.

10.3. Consistent with the scope of this Agreement, any DTSC-approved workplan, report, specification, or schedule required under this Consent Agreement shall be deemed incorporated into this Consent Agreement.

10.4. Verbal advice, suggestions, or comments given by DTSC representatives will not constitute an official approval or decision.

SUBMITTALS

11.1. Beginning with the first full month following the effective date of this Consent Agreement, Respondent shall provide DTSC with quarterly progress reports of corrective action activities conducted pursuant to this Consent Agreement. Progress reports are due on the 15th day of the first month following the close of each reporting period. The progress reports shall conform to the Scope of Work for Progress Reports contained in Attachment 4, to the extent applicable. DTSC may adjust the frequency of progress reporting to be consistent with site-specific activities.

11.2. Any document submitted by Respondent pursuant to this Consent Agreement shall be signed and certified by the project coordinator, a responsible corporate officer, or a duly authorized representative.

11.3. The certification required by paragraph 11.2 above, shall be in the following form:

> I certify that the information contained in or accompanying this submittal is true, accurate, and complete. As to those portions of this submittal for which I cannot personally verify the accuracy, I certify that this submittal and all attachments were prepared at my direction in accordance with procedures designed to assure that qualified personnel properly gathered and evaluated the information submitted.
>
> Signature: _____
>
> Name: _____
>
> Title: _____
>
> Date: _____

11.4. Respondent shall provide at least two copies of all documents, including but not limited to, workplans, reports, and correspondence. Submittals specifically exempted from this copy requirement are all progress reports and correspondence of less than 15 pages, of which one copy is required.

11.5. Unless otherwise specified, all reports, correspondence, approvals, disapprovals, notices, or other submissions relating to this Consent Agreement shall be in writing and shall be sent to the current Project Coordinators.

PROPOSED CONTRACTOR/CONSULTANT

12. All work performed pursuant to this Consent Agreement shall be under the direction and supervision of a professional engineer or registered geologist, registered in California, with expertise in hazardous waste site cleanup. Respondent's contractor or consultant shall have the technical expertise sufficient to fulfill his or her responsibilities. Within 14 days of the effective date of this Consent Agreement, Respondent shall notify DTSC Project Coordinator in writing of the name, title, and qualifications of the professional engineer or registered geologist and of any contractors

or consultants and their personnel to be used in carrying out the terms of this Consent Agreement.

ADDITIONAL WORK

13. Consistent with the scope of this Agreement, DTSC may determine or Respondent may propose that certain tasks, including investigatory work, engineering evaluation, or procedure/methodology modifications are necessary in addition to, or in lieu of, the tasks and deliverables included in any part of DTSC-approved workplans. DTSC shall request in writing that Respondent perform the additional work and shall specify the basis and reasons for DTSC's determination that the additional work is necessary. Within 14 days after the receipt of such determination, Respondent may confer with DTSC to discuss the additional work DTSC has requested. If required by DTSC, Respondent shall submit to DTSC a workplan for the additional work. Such workplan shall be submitted to DTSC within 30 days of receipt of DTSC's determination or according to an alternate schedule established by DTSC. Upon approval of a workplan, Respondent shall implement it in accordance with the provisions and schedule contained therein. The need for, and disputes concerning, additional work are subject to the dispute resolution procedures specified in this Consent Agreement.

QUALITY ASSURANCE

14.1. All sampling and analyses performed by Respondent under this Consent Agreement shall follow applicable DTSC and U.S. EPA guidance for sampling and analysis. Workplans shall contain quality assurance/quality control and chain of custody procedures for all sampling, monitoring, and analytical activities. Any deviations from the approved workplans must be approved by DTSC prior to implementation, must be documented, including reasons for the deviations, and must be reported in the applicable report.

14.2. The names, addresses, and telephone numbers of the California State certified analytical laboratories Respondent proposes to use must be specified in the applicable workplans.

SAMPLING AND DATA/DOCUMENT AVAILABILITY

15.1. Respondent shall submit to DTSC upon request the results of all sampling and/or tests or other data generated by its employees, agents, consultants, or contractors pursuant to this Consent Agreement.

15.2. Respondent shall notify DTSC in writing at least seven days prior to beginning each separate phase of field work approved under any workplan required by this Consent Agreement. If Respondent believes it must commence emergency field activities without delay, Respondent may seek emergency telephone authorization from DTSC Project Coordinator or, if the Project Coordinator is unavailable, his/her Branch Chief, to commence such activities immediately.

15.3. At the request of DTSC, Respondent shall provide or allow DTSC or its authorized representative to take split or duplicate samples of all samples collected by Respondent pursuant to this Consent Agreement. Similarly, at the request of

Respondent, DTSC shall allow Respondent or its authorized representative to take split or duplicate samples of all samples collected by DTSC under this Consent Agreement.

ACCESS

16. Subject to the Facility's security and safety procedures, Respondent agrees to provide DTSC and its representatives access at all reasonable times to the Facility and any off-site property to which access is required for implementation of this Consent Agreement and shall permit such persons to inspect and copy all records, files, photographs, documents, including all sampling and monitoring data, that pertain to work undertaken pursuant to this Consent Agreement and that are within the possession or under the control of Respondent or its contractors or consultants.

RECORD PRESERVATION

17.1. Respondent shall retain, during the pendency of this Consent Agreement and for a minimum of six years after its termination, all data, records, and documents that relate in any way to the performance of this Consent Agreement or to hazardous waste management and/or disposal at the Facility. Respondent shall notify DTSC in writing 90 days prior to the destruction of any such records, and shall provide DTSC with the opportunity to take possession of any such records. Such written notification shall reference the effective date, caption, and docket number of this Consent Agreement and shall be addressed to:

Chief
Southern California Permitting and Corrective Action Branch
Hazardous Waste Management Program
Department of Toxic Substances Control
1011 North Grandview Avenue
Glendale, California 91201

17.2. If Respondent retains or employs any agent, consultant, or contractor for the purpose of carrying out the terms of this Consent Agreement, Respondent will require any such agents, consultants, or contractors to provide Respondent a copy of all documents produced pursuant to this Consent Agreement.

17.3. All documents pertaining to this Consent Agreement shall be stored in a central location at the Facility, or at a location otherwise agreed to by the parties, to afford easy access by DTSC and its representatives.

DISPUTE RESOLUTION

18.1. The parties agree to use their best efforts to resolve all disputes informally. The parties agree that the procedures contained in this section are the sole administrative procedures for resolving disputes arising under this Consent Agreement. If Respondent fails to follow the procedures contained in this section, it shall have waived its right to further consideration of the disputed issue.

18.2. If Respondent disagrees with any written decision by DTSC pursuant to this Consent Agreement, Respondent's Project Coordinator shall orally notify DTSC's Project Coordinator of the dispute. The Project Coordinators shall attempt to resolve the dispute informally.

18.3. If the Project Coordinators cannot resolve the dispute informally, Respondent may pursue the matter formally by placing its objection in writing. Respondent's written objection must be forwarded to Chief, Southern California Permitting and Corrective Action Branch, Hazardous Waste Management Program, Department of Toxic Substances Control, with a copy to DTSC's Project Coordinator. The written objection must be mailed to the Branch Chief within 14 days of Respondent's receipt of DTSC's written decision. Respondent's written objection must set forth the specific points of the dispute and the basis for Respondent's position.

18.4. DTSC and Respondent shall have 14 days from DTSC's receipt of Respondent's written objection to resolve the dispute through formal discussions. This period may be extended by DTSC for good cause. During such period, Respondent may meet or confer with DTSC to discuss the dispute.

18.5. After the formal discussion period, DTSC will provide Respondent with its written decision on the dispute. DTSC's written decision will reflect any agreements reached during the formal discussion period and be signed by the Branch Chief or his/her designee.

18.6. During the pendency of all dispute resolution procedures set forth above, the time periods for completion of work required under this Consent Agreement that are affected by such dispute shall be extended for a period of time not to exceed the actual time taken to resolve the dispute. The existence of a dispute shall not excuse, toll, or suspend any other compliance obligation or deadline required pursuant to this Consent Agreement.

RESERVATION OF RIGHTS

19.1. DTSC reserves all of its statutory and regulatory powers, authorities, rights, and remedies, which may pertain to Respondent's failure to comply with any of the requirements of this Consent Agreement. Respondent reserves all of its statutory and regulatory rights, defenses and remedies, as they may arise under this Consent Agreement. This Consent Agreement shall not be construed as a covenant not to sue, release, waiver, or limitation on any powers, authorities, rights, or remedies, civil or criminal, that DTSC or Respondent may have under any laws, regulations or common law.

19.2. DTSC reserves the right to disapprove of work performed by Respondent pursuant to this Consent Agreement and to request that Respondent perform additional tasks consistent with the scope of this Agreement.

19.3. DTSC reserves the right to perform any portion of the work consented to herein or any additional site characterization, feasibility study, and/or remedial actions it deems necessary to protect human health and/or the environment. DTSC may exercise its authority under any applicable state or federal law or regulation to undertake response actions at any time. DTSC reserves its right to seek reimbursement from Respondent for costs incurred by the State of California with

respect to such actions. DTSC will notify Respondent in writing as soon as practicable regarding the decision to perform any work described in this section.

19.4. If DTSC determines that activities in compliance or noncompliance with this Consent Agreement have caused or may cause a release of hazardous waste and/or hazardous waste constituents, or a threat to human health and/or the environment, or that Respondent is not capable of undertaking any of the work required, DTSC may order Respondent to stop further implementation of this Consent Agreement for such period of time as DTSC determines may be needed to abate any such release or threat and/or to undertake any action which DTSC determines is necessary to abate such release or threat. The deadlines for any actions required of Respondent under this Consent Agreement affected by the order to stop work shall be extended to take into account DTSC's actions.

19.5. This Consent Agreement is not intended to be nor shall it be construed to be a permit. This Consent Agreement is not a substitute for, and does not preclude DTSC from requiring, any hazardous waste facility permit, post closure permit, closure plan or post closure plan. The parties acknowledge and agree that DTSC's approval of any workplan, plan, and/or specification does not constitute a warranty or representation that the workplans, plans, and/or specifications will achieve the required cleanup or performance standards. Compliance by Respondent with the terms of this Consent Agreement shall not relieve Respondent of its obligations to comply with the Health and Safety Code or any other applicable local, state, or federal law or regulation.

OTHER CLAIMS

20. Except as provided in this Consent Agreement, nothing in this Consent Agreement shall constitute or be construed as a release by DTSC or Respondent from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous constituents, hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken or migrating from the Facility.

COMPLIANCE WITH WASTE DISCHARGE REQUIREMENTS

21. Respondent shall comply with all applicable waste discharge requirements issued by the State Water Resources Control Board or a California regional water quality control board.

OTHER APPLICABLE LAWS

22. All actions required by this Consent Agreement shall be conducted in accordance with the requirements of all local, state, and federal laws and regulations. Respondent shall obtain or cause its representatives to obtain all permits and approvals necessary under such laws and regulations.

REIMBURSEMENT OF DTSC'S COSTS

23.1. Respondent shall pay DTSC's costs incurred in the implementation of this Consent Agreement. Such costs shall include DTSC's costs incurred from July 1, 2006 in (1) the preparation and implementation of this Consent Agreement; (2) reviewing and commenting on any document submitted by Respondent to DTSC; and (3) overseeing any corrective action work conducted by Respondent.

23.2. An estimate of DTSC's costs is attached as Exhibit B showing the amount of $65,560.00. It is understood by the parties that this amount is only a cost estimate for the activities shown on Exhibit B and it may differ from the actual costs incurred by DTSC in overseeing these activities or in implementing this Consent Agreement. DTSC will provide additional cost estimates to Respondent as the work progresses under the Consent Agreement.

23.3. Respondent shall make an advance payment to DTSC in the amount of $20,000 within 30 days of the effective date of this Consent Agreement. If the advance payment exceeds DTSC's costs, DTSC will refund the balance within 120 days after the execution of the Acknowledgment of Satisfaction pursuant to Section 27 of this Consent Agreement.

23.4. DTSC will provide Respondent with a billing statement at least quarterly, which will include the name(s) of the employee(s), identification of the activities, the amount of time spent on each activity, and the hourly rate charged. If Respondent does not pay an invoice within 60 days of the date of the billing statement, the amount is subject to interest as provided by Health and Safety Code section 25360.1.

23.5. DTSC will retain all costs records associated with the work performed under this Consent Agreement as required by state law. DTSC will make all documents that support the DTSC's cost determination available for inspection upon request, as provided by the Public Records Act.

23.6. Any dispute concerning DTSC's costs incurred pursuant to this Consent Agreement is subject to the Dispute Resolution provision of this Consent Agreement and the dispute resolution procedures as established pursuant to Health and Safety Code section 25269.2. DTSC reserves its right to recover unpaid costs under applicable state and federal laws.

23.7. All payments shall be made within 30 days of the date of the billing statement by check payable to the Department of Toxic Substances Control and shall be sent to:

Accounting Unit
Department of Toxic Substances Control
P. O. Box 806
Sacramento, California 95812-0806

All checks shall reference the name of the Facility, the Respondent's name and address, and the docket number of this Consent Agreement. Copies of all checks and letters transmitting such checks shall be sent simultaneously to DTSC's Project Coordinator.

MODIFICATION

24.1. This Consent Agreement may be modified by mutual agreement of the parties. Any agreed modification shall be in writing, shall be signed by both parties, shall have as its effective date the date on which it is signed by all the parties, and shall be deemed incorporated into this Consent Agreement.

24.2. Any requests for revision of an approved workplan requirement must be in writing. Such requests must be timely and provide justification for any proposed workplan revision. DTSC has no obligation to approve such requests, but if it does so, such approval will be in writing and signed by the Chief, Southern California Permitting and Corrective Action,Department of Toxic Substances Control, or his or her designee. Any approved workplan revision shall be incorporated by reference into this Consent Agreement.

TERMINATION AND SATISFACTION

25. The provisions of this Consent Agreement shall be deemed satisfied upon the execution by both parties of an Acknowledgment of Satisfaction (Acknowledgment). DTSC will prepare the Acknowledgment for Respondent's signature. The Acknowledgment will specify that Respondent has demonstrated to the satisfaction of DTSC that the terms of this Consent Agreement including payment of DTSC's costs have been satisfactorily completed. The Acknowledgment will affirm Respondent's continuing obligation to preserve all records after the rest of the Consent Agreement is satisfactorily completed.

EFFECTIVE DATE

26. The effective date of this Consent Agreement shall be the date on which this Consent Agreement is signed by all the parties. Except as otherwise specified, "days" means calendar days.

SIGNATORIES

27. Each undersigned representative certifies that he or she is fully authorized to enter into this Consent Agreement.

DATE: 6 Nov 2006 BY: _____
Representing Respondent

JULIE WAY, PROJECT DIRECTOR
Name and Title of Respondent's Representative

DATE: Nov. 16, 2006 BY: _____
Jose Kou, P.E., Chief
Southern California Permitting
and Corrective Action Branch
Department of Toxic Substances Control

ATTACHMENT 1

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION

PURPOSE

The purpose of this RCRA Facility Investigation (RFI) is to determine the nature and extent of releases of hazardous waste or constituents from regulated units, solid waste management units, and other source areas at the Facility and to gather all necessary data to support the Corrective Measures Study. The RFI must include characterization of the facility (processes, waste management, etc.), environmental setting, source areas, nature and extent of contamination, migration pathways (transport mechanisms) and all potential receptors.

SCOPE

The documents required for an RFI are a Current Conditions Report, a RCRA Facility Investigation Workplan, a RCRA Facility Investigation Report, a Health and Safety Plan. The scope of work (SOW) for each document is specified below. Scope of work for Public Participation Plan for the entire corrective action process is also included.

A. Current Conditions Report

The Current Conditions Report must describe existing information pertinent to the facility including operations, processes, waste management, geology, hydrogeology, contamination, migration pathways, potential receptor populations and interim corrective measures. The required format for a current conditions report is described below.

1. Introduction

1.1 <u>Purpose</u>

Describe the purpose of the current conditions report (e.g., summary and evaluation of existing information related to the facility; required as a component of RFI).

1.2 <u>Organization of Report</u>

Describe how the report is organized.

2. Facility Description

Summarize background, current operations, waste management and products produced at the facility. Include a map that shows the general geographic

location of the facility.

Describe current facility structures including any buildings, tanks, sumps, wells, waste management areas, landfills, ponds, process areas and storage areas.

Include detailed facility maps that clearly show current property lines, the owners of all adjacent property, surrounding land use (residential, commercial, agricultural, recreational, etc.), all tanks, buildings, process areas, utilities, paved areas, basements, rights-of-way, waste management areas, ponds, landfills, piles, underground tanks, wells and other facility features.

3. Facility History

3.1 Ownership History

Describe the ownership history of the facility.

3.2 Operational History

Describe in detail how facility operations, processes and products have changed over time (historical aerial photographs could be useful for this purpose).

3.3 Regulatory History

Describe all permits (including waste discharge requirements, if located in California) requested or received, any enforcement actions taken by regulatory agencies and any closure activities that are planned or underway.

3.4 Waste Generation

Describe all wastes (solid or hazardous) that have been generated at the facility. Include approximate waste volumes generated and summaries of any waste analysis data. Show how the waste stream (volume and chemical composition) has changed over time.

3.5 Waste Management

Describe in detail all past solid and hazardous waste treatment, storage and disposal activities at the facility. Show how these activities have changed over time and indicate the current status. Make a clear distinction between active waste management units and older out of service waste management units. Identify which waste management units are regulated under RCRA or California Health and Safety Code.

Include maps showing: (1) all solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980, (2) all known past solid waste or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980, and (3) all known past or present underground tanks or piping.

3.6 Spill and Discharge History

Provide approximate dates or periods of past product and waste spills, identify the materials spilled and describe any response actions conducted. Include a summary of any sampling data generated as a result of the spill. Include a map showing approximate locations of spill areas at the facility.

3.8 Chronology of Critical Events

Provide a chronological list (including a brief description) of major events, communications, orders, notices of violation, spills, discharges that occurred throughout the facility's history.

4. Environmental Setting

4.1 Location/Land Use

Discuss facility size, location and adjacent land use. Include a rough demographic profile of the human population who use or have access to the facility and adjacent lands. Provide approximate distance to nearest residential areas, schools, nursing homes, hospitals, parks, playgrounds, etc.

4.2 Local Ecology

Describe any endangered or threatened species near the facility. Include a description of the ecological setting on and adjacent to the facility. Provide approximate distance to nearest environmentally sensitive areas such as marsh lands, wetlands, streams, oceans, forests, etc.

4.3 Topography and Surface Drainage

Describe the regional and site specific topography and surface drainage patterns that exist at the facility. Include a map that shows the topography and surface drainage depicting all waterways, wetlands, floodplains, water features, drainage patterns and surface water containment areas.

4.4 Climate

Discuss mean annual temperatures, temperature extremes, 24-hour rainfall, average annual rainfall, prevailing wind direction, etc.

4.5 Surface Water Hydrology

Describe the facility's proximity (distance) to surface water bodies (e.g. coastal waters, lakes, rivers, creeks, drainage basins, floodplains, vernal pools, wetlands, etc.). Describe flows on-site and flows that leave the site.

4.6 Geology

Describe the regional and site specific geology including stratigraphy and structure. Include cross sections to show the subsurface stratigraphy. Cross-sections should be at a natural scale (vertical equals horizontal) and of sufficient detail to accurately plot cut and fill, alluvium, and structural features. Cross-sections should be taken on a grid pattern oriented normal to major geologic structure and spaced close enough to determine geology and ground water flow on a unit-by-unit basis.

4.7 Hydrogeology

Describe the regional and site specific hydrogeologic setting including any information concerning local aquifers, ground water levels, gradients, flow direction, hydraulic conductivity, and velocity. Include potentiometric surface contour maps and show direction of groundwater flow. Describe the beneficial uses of the ground water (e.g. drinking water supply, agricultural water supply, etc.). Describe temporal variations (seasonal and historical).

4.8 Ground Water Monitoring System

Describe the facility's ground water monitoring system including a table detailing the existing well construction. The table must, at a minimum, identify the following construction details for each well:

Well ID
Completion Date
Drilling Method
Borehole Diameter (inches)
Well Casing Diameter and Type
Measuring Point Elevation (feet MSL)
Borehole Depth (feet BGS)
Depth of Well (feet)
Screened Interval

Formation Screened
Slot Size and Type (inches)
Filter Pack Material
Filter Pack Thickness
Type of Filter Pack Seal
Thickness of Filter Pack Seal
Pump System (dedicated or non-dedicated)
Type of Pump
Approximate Depth to Water (feet BGS)

If some of this information is not available, so indicate on the table with an "NA". {BGS: Below Ground Surface, MSL: Mean Sea Level}

The monitoring well locations must be shown on the facility map (see Section A.2 of this Attachment).

5. Existing Degree and Extent of Contamination

For each medium where the Consent Agreement identifies a release (e.g. soil, ground water, surface water, air, etc.), describe the existing extent of contamination. This description must include all available monitoring data and qualitative information on the locations and levels of contamination at the facility (both onsite and offsite). Include a general assessment of the data quality, a map showing the location of all existing sampling points and potential source areas and contour maps showing any existing ground water plumes at the facility (if ground water release). Highlight potential ongoing release areas that would warrant use of interim corrective measures (see section 8, Interim Corrective Measures and Stabilization Assessment).

5.1 Previous Investigations

List and briefly describe all previous investigation that have occurred at the facility, agencies (e.g., DTSC=s Site Mitigation Branch, the Regional Water Quality Control Board, etc.) which required and/or oversaw the investigations, and agency contacts.

6. Potential Migration Pathways

6.1 Physical Properties of Contaminants

Identify the applicable physical properties for each contaminant that may influence how the contaminant moves in the environment. These properties could include melting point (EC), water solubility (mg/L), vapor pressure (mm Hg), Henry's law constant (atm m^3/mol), density (g/mL), dynamic viscosity (cp), kinematic viscosity (cs), octanol/water partition

coefficient (log Kow), soil organic carbon/water coefficient (log koc) and soil/water partition coefficients. Include a table that summarizes the applicable physical properties for each contaminant.

6.2 Conceptual Model of Contamination Migration

Develop a conceptual model of contaminant migration. The conceptual model consists of a working hypothesis of how the contaminants may move from the release source to the receptor population. The conceptual model is developed by looking at the applicable physical parameters for each contaminant and assessing how the contaminant may migrate given the existing site conditions (geologic features, depth to ground water, etc.).

Describe the phase (water, soil, gas, non-aqueous) and location where contaminants are likely to be found (e.g., if a ground water contaminant has a low water solubility and a high density, then the contaminant will likely sink and be found at the bottom of the aquifer, phase: non-aqueous). Include a discussion of potential transformation reactions that could impact the type and number of contaminants (i.e., what additional contaminants could be expected as a result of biotic and abiotic transformation reactions given the existing soil conditions).

A typical conceptual model should include a discussion similar to the following: benzene, ethylbenzene, toluene, and xylenes are potential contaminants at the facility. Based on their high vapor pressures and relatively low water solubilities (see Henry=s Law constant), the primary fate of these compounds in surface soils or surface water is expected to be volatilization to the atmosphere. These mono-cyclic aromatic hydrocarbons may leach from soils into ground water. The log koc (soil organic carbon/water partition coefficient) values for these compounds ranges from 1.9 to 4.0 indicating that sorption to organic matter in soils or sediments may occur only to a limited extent.

7. Potential Impacts of Existing Contamination

Describe the potential impacts on human health and the environment from any existing contamination and/or ongoing activities at the facility. This description must consider the possible impacts on sensitive ecosystems and endangered species as well as on local populations. Potential impacts from any releases to ground water, surface water, soil (including direct contact with contaminated surface soil) and air (including evaporation of volatile organic compounds from contaminated soil) must be discussed. If air could be a significant pathway, soil gas or vapor emissions and/or ambient air monitoring should be described.

7.1 Ground Water Releases

Identify all wells (municipal, domestic, agricultural, industrial, etc.) within a 1-mile radius of the facility. Include a summary of available water sampling data for any identified municipal, industrial or domestic supply wells.

Develop a well inventory table that lists the following items for each identified well:

Well Designation
State ID
Reported Owner
Driller
Date of Completion
Original Use of Well
Current Use of Well
Drilling Method
Borehole Diameter (inches)
Casing Diameter (inches)
Perforated Interval (feet)
Gravel Pack Interval (feet)
Total Well Depth (feet)
Depth of Water (feet below ground surface)
Date of Water Level Measurement

If some of this information is not available, so indicate on the table with an "NA". Include a regional map showing the facility, ground water flow direction and the location of all identified wells within a 1-mile radius of the facility.

Identify and describe any potential ground water discharge to surface water bodies. Identify and list all relevant and applicable water standards for the protection of human health and the environment (e.g., maximum contaminant levels, water quality standards, etc.).

7.2 Surface Water Releases

Discuss the facility's potential impact on surface water within a 2-mile radius of the facility. Describe the potential beneficial uses of the surface water (e.g., drinking water supply, recreational, agricultural, industrial, or environmentally sensitive). Identify all water supply intake points and contact areas within a 2-mile radius of the facility. Include a summary of the most recent water sampling data available for each of the identified water supply intake points. Include a description of the biota in surface water supply intake points. Include a description of the biota in surface

water bodies on, adjacent to, or which can be potentially affected by the release. Also summarize any available sediment sampling data.

Include a regional map showing the facility, surface water flow direction, beneficial use areas, and the location of any identified water supply intake points or contact areas that are within a 2-mile radius of the facility.

7.3 Sensitive Ecosystem/Habitats

Discuss the facility's potential impact on sensitive ecosystem.

8. Interim Corrective Measures and Stabilization Assessment

Identify all corrective measures that were or are being undertaken at the facility to stabilize contaminant releases. Describe the objective of the corrective measures including how the measure is mitigating a potential threat to human health and the environment. Summarize the design features of the corrective measure. Include a schedule for completing any ongoing or future work.

Identify and describe potential interim corrective measure alternatives that could be implemented immediately to stabilize any ongoing releases and/or prevent further migration of contaminants.

9. Date Needs

Assess the amount and quality of existing data concerning the facility and determine what additional information must be collected to meet the objectives of the RFI. This assessment must identify any additional information that my be needed to (1) support development of interim measures for early action and (2) adequately evaluate and compare corrective measures alternatives (e.g., field work, treatability studies, computer modeling, literature searches, vendor contacts, etc.). For example, if soil vapor extraction (SVE) is a likely option to address contamination at the facility, then the RFI should collect applicable field data to assess SVE (e.g., soil gas analysis, depth to ground water, etc.). The RFI Workplan must detail how this additional information will be collected.

10. References

Provide a list of references cited in the Current Conditions Report.

B. RCRA Facility Investigation Workplan

The RCRA Facility Investigation (RFI) Workplan shall define the procedures necessary to:

1. Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any ground water contamination in and around the facility;

2. Characterize the geology and hydrogeology in and around the facility;

3. Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any soil contamination in and around the facility;

4. Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any soil gas contamination in and around the facility;

5. Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any surface water contamination (includes surface water sediments) at the facility;

6. Characterize the presence, magnitude, extent (horizontal and vertical), rate of movement and direction of any air releases at the facility;

7. Identify and characterize any potential sources of contamination;

8. Characterize the potential pathways of contaminant migration;

9. Identify any actual or potential receptors;

10. Gather all data to support a risk and/or ecological assessment;

11. Gather all necessary data to determine where interim measures are needed and to support the use of interim measures to address immediate threats to human health and/or the environment, to prevent or minimize the spread of contaminants, to control sources of contamination and to accelerate the corrective action process; and

12. Gather all necessary data to support the Corrective Measures Study (required for all releases). This could include conducting treatability, pilot, laboratory and/or bench scale studies to assess the effectiveness of a treatment method.

The RFI Workplan shall describe all aspects of the investigation, including project management, sampling and analysis, well drilling and installation and quality assurance and quality control. If the scope of the investigation is such that more than one phase is necessary, the "Phase 1" RFI Workplan must include a summary description of each phase. For example, the first phase of a RFI could be used to gather information necessary to focus the second phase into key areas of the facility that need further investigation.

The required format for an RFI Workplan is described below:

1. Introduction

Briefly introduce the Workplan. Discuss the Consent Agreement requiring the RFI and how the Workplan is organized.

2. Investigation Objectives

2.1 Project Objectives

Describe the overall objectives and critical elements of the RFI. State the general information needed from the site (e.g., soil chemistry, hydraulic conductivity of aquifer, stratigraphy, ground water flow direction, identification of potential receptors, etc.). The general information should be consistent with the objectives of the RFI and the data needs identified in the Current Conditions Report.

2.2 Data Quality Objectives

Provide data quality objectives that identify what data are needed and the intended use of the data.

3. Project Management

Describe how the investigation will be managed, including the following information:

- Organization chart showing key personnel, levels of authority and lines of communication;
- Project Schedule; and
- Estimated Project Budget.

Identify the individuals or positions who are responsible for: project management, field activities, laboratory analysis, database management, overall quality assurance, data validation, etc. Include a description of qualifications for personnel performing or directing the RFI, including contractor personnel.

4. Facility Background

Summarize existing contamination, local hydrogeologic setting and any other areas of concern at the facility. Include a map showing the general geographic location of the facility and a more detailed facility map showing the areas of

possible contamination. Provide a reference to the Current Conditions Report and/or other applicable documents as a source of additional information.

5. Field Investigation

5.1 Task Description

Provide a qualitative description of each investigation task. Example tasks may include, but are not limited to the following:

Task 1: Surface Soil Sampling
Task 2: Surface Geophysics, Subsurface Soil Boring, and Borehole Geophysics
Task 3: Data Gathering to Support Interim Corrective Measures
Task 4: Monitoring Well Installation
Task 5: Aquifer Testing
Task 6: Ground Water Sampling
Task 7: Potential Receptor Identification
Task 8: Treatability Studies

5.2 Rationale for Sampling

Describe where all samples will be collected (location and depth), types of matrices that will be sampled and the analytical parameters. Explain the rationale for each sampling point, the total number of sampling points, and any statistical approach used to select these points. The conceptual model of contaminant migration developed in the Current Conditions Report should be considered when selecting sampling locations and depths. If some possible sampling points are excluded, explain why. Describe any field screening techniques that will be used to identify samples for laboratory analysis. Include the rationale for use of field screening techniques and criteria for sample selection.

5.2.1 Background Samples

Background samples should be analyzed for the composite set of parameters for each matrix; treat sediments, surface soils and subsurface soils as separate matrices. Background samples are collected, numbered, package, and sealed in the same manner as other samples. For long term and/or especially large projects, it is recommended that 10% of samples collected be from background locations.

5.3 Sample Analysis

List and discuss all analysis proposed for the project. Include a table that

summarizes the following information for each analysis to be performed:

Analytical Parameters
Analytical Method Reference Number (from EPA SW 846)
Sample Preparation and/or Extraction Method Reference Number (from SW 846)
Practical Quantitation Limits

Discuss the rationale for selection of the analytical parameters. The rationale must relate to site history and the RFI objectives. The achievable detection limits or quantitation limits stated in the selected methods must be adequate for valid comparisons of analytical results against any action levels or standards. For example, the objective may be to collect ground water data for comparison with Maximum Contaminant Levels (MCLs). If this were the case, it would be important to ensure that any ground water test methods had detection limits below the MCLs. Give an explanation if all samples from the same matrix will not be analyzed for the same parameters.

Provide the name(s) of the laboratory(s) that will be doing the analytical work. Indicate any special certifications or ratings of the laboratory. Describe the steps that will be taken to select and pre-qualify analytical laboratories to be used including any previous audits and/or other criteria. If a specific laboratory has not yet been selected, list at least 3 laboratories that are being considered for the analytical work.

5.4 Sample Collection Procedures

Describe how sampling points will be selected in the field, and how these locations will be documented and marked for future reference. If a sampling grid will be used, describe the dimensions and layout planned for the grid.

Outline sequentially or step-by-step the procedure for collecting a sample for each matrix and each different sampling technique. Include a description of sampling equipment (including materials of construction), field measurements, sample preservation, housekeeping/ cleanliness techniques and well purging procedures. The procedure described must ensure that a representative sample is collected, and that sample handling does not result in cross contamination or unnecessary loss of contaminants. Special care in sample handling for volatile organic samples must be addressed.
Described how and when duplicates, blanks, laboratory quality control samples and background samples will be collected.

The RFI must include sufficient maps and tables to fully describe the sampling effort. This shall include, at a minimum, a map showing all proposed sampling locations and tables that contain the following information:

Sample Collection Table

Sampling Location/Interval
Analytical Parameters (e.g., volatile organic compounds)
Analytical Method Number
Matrix
Preservation Method
Holding Times
Containers (quantity, size, type plus footnotes that discuss source and grade of containers

Sample Summary Table

Sample Description/Area (include QC samples)
Analytical Parameters
Analytical Method Number
Preparation or Extraction Method Number
Matrix
Number of Sample Sites
Number of Analyses

5.4.1 Equipment Decontamination

Describe the decontamination procedure for all drilling and sampling equipment (including metal sleeves). Clearly document the decontamination procedures.

5.4.2 Equipment Calibration and Maintenance

Logbooks or pre-formatted calibration worksheets should be maintained for major field instruments, to document servicing, maintenance and instrument modification. The calibration, maintenance and operating procedures for all instruments, equipment and sampling tools must be based upon manufacturer's instructions. List all field equipment to be used, specify the maintenance/calibration frequency for each instrument and the calibration procedures (referenced in text and included in appendices).

5.4.3 Sample Packaging and Shipment

Describe how samples will be packaged and shipped. All applicable Department of Transportation regulations must be followed.

5.4.4 Sample Documentation

Discuss the use of all paperwork including field notebooks, record logs, photographs, sample paperwork, and Chain of Custody forms (include a blank copy in RFI Workplan Appendices) and seals.

Describe how sample containers will be labeled and provide an example label if available. At a minimum, each sample container label should include: project ID, sample location, analytical parameters, date sampled and any preservative added to the sample.

A bound field log book must be maintained by the sampling team to provide a daily record of events.

Field log books shall provide the means of recording all data regarding sample collection. All documentation in field books must be made in permanent ink. If an error is made, corrections must be made by crossing a line through the error and entering the correct information. Changes must be initialed, no entries shall be obliterated or rendered unreadable. Entries in the log book must include, at a minimum, the following for each days sampling:

Date
Starting Time
Meteorological Conditions
Field Personnel Protection
Level of Personnel Protection
Site Identification
Field Observations/Parameters
Sample Identification Numbers
Location and Description of Sampling Points
Number of Samples Collected
Time of Sample Collection
Signature of Person Making the Entry
Problems encountered and actions taken to resolve problems
Photo Log
Deviations from Work Plan

5.4.5 Disposal of Contaminated Materials

Describe the storage and disposal methods for all contaminated cuttings, well development and purge water, disposable equipment,

decontamination water, and any other contaminated materials. The waste material must be disposed of in a manner consistent with local, state and federal regulations.

5.4.5 Standard Operating Procedures

If Standard Operating Procedures (SOPs) are referenced, the relevant procedure must be summarized in the RFI Workplan. The SOP must be specific to the type of tasks proposed and be clearly referenced in the RFI Workplan. The SOP must also be directly applicable, as written, to the RFI Workplan; otherwise, modifications to the SOP must be discussed. Include the full SOP description in the RFI Workplan appendix.

5.5 Well Construction and Aquifer Testing

When new monitoring wells (or piezometer) are proposed, describe the drilling method, well design and construction details (e.g., depth of well, screen length, slot size filter pack material, etc.) and well development procedures. Describe the rationale for proposed well locations and selection of all well design and construction criteria (i.e., provide rationale for selection of slot size and screen length).

When aquifer testing is proposed, describe the testing procedures, flow rates, which wells are involved, test periods, how water levels will be measured, and any other pertinent information.

6. Quality Assurance and Quality Control

Quality control checks of filed and laboratory sampling and analysis serve two purposes: to document the data quality, and to identify areas of weakness within the measurement process which need correction.

Include a summary table of data quality assurance objectives that, at a minimum, lists:

Analysis Group (e.g., volatile organic compounds)
Matrix
Practical Quantitation Limits (PQL)
Spike Recovery Control Limits (%R)
Duplicate Control Limits +/-(RPD)
QA Sample Frequency
Data Validation

A reference may note the specific pages from EPA's SW 846 Guidance Document that list the test method objectives for precision and accuracy. If the

field and laboratory numerical data quality objectives for precision are the same and presented on a single table, then a statement should be made to this effect and added as a footnote to the table (e.g., "These limits apply to both field and laboratory duplicates"). Include a copy of the analytical laboratory quality assurance/quality control plan in the appendices of the RFI Workplan and provide the equations for calculating precision and accuracy.

6.1 Field Quality Control Samples

6.1.1 Field Duplicates

Duplicates are additional samples that must be collected to check for sampling and analytical precision. Duplicate samples for all parameters and matrices must be collected at a frequency of at least one (1) sample per week or ten (10) percent of all field samples, whichever is greater.

Duplicates should be collected from points which are known or suspected to be contaminated. For large projects, duplicates should be spread out over the entire site and collected at regular intervals.

Duplicates must be collected, numbered, packaged, and sealed in the same manner as other samples; duplicate samples are assigned separate sample numbers and submitted blind to the laboratory.

6.1.2 Blank Samples

Blank samples are samples that must be collected to check for possible cross-contamination during sample collection and shipment and in the laboratory. Blank samples should be analyzed for all parameters to be evaluated. At least one blank sample per day must be collected for all water and air sampling. Additionally, field blanks are required for soil sampling if non-dedicated field equipment is being used for sample collection.

Equipment and filed bottle blank samples may be required. Blank samples must be prepared using analytically-certified, organic-free (HPLC-grade) water for organic parameters and metal-free (deionized-distilled) water for inorganic parameters. Blanks must be collected, numbered, packaged, and sealed in the same manner as other samples; blank samples are assigned separate sample numbers and submitted blind to the laboratory. The following types of blank samples may be required:

Equipment Blank: An equipment blank must be collected when sampling equipment or a sample collection vessel is

decontaminated and reused in the field. Use the appropriate Ablank@ water to rinse the sampling equipment after the equipment has been decontaminated and then collect this water in the proper sample containers.

Field Bottle Blank: This type of blank must be collected when sampling equipment decontamination is not necessary. The field bottle blank is obtained by pouring the appropriate Ablank@ water into a container at a sampling point.

6.2 Laboratory Quality Control Samples

Laboratories routinely perform medium spike and laboratory duplicate analysis on field samples as a quality control check. A minimum of one (1) field sample per week or one (1) per 20 samples (including field blanks and duplicates), whichever is greater, must be designated as the "Lab QC Sample" for the matrix and laboratory duplicate analysis.

Laboratory quality control samples should be selected from sampling points which are suspected to be moderately contaminated. Label the bottles and all copies of the paperwork as "Lab QC Sample"; the laboratory must know that this sample is for their QC analyses. The first laboratory QC sample of the sampling effort should be part of the first or second day's shipment. Subsequent laboratory QC samples should be spread out over the entire sampling effort.

For water matrices, 2-3 times the normal sample volume must be collected for the laboratory QC sample.

6.3 Performance System Audits by Respondents

This section should describe any internal performance and/or system audit which the Respondents will conduct to monitor the capability and performance of the project. The extent of the audit program should reflect the data quality needs and intended data uses. Audits are used to quickly identify and correct problems thus preventing and/or reducing costly errors. For example, a performance audit could include monitoring field activities to ensure consistency with the workplan. If the audit strategy has already been addressed in a QA program plan or standard operating procedure, cite the appropriate section which contains the information.

7. Data Management

Describe how investigation data and results will be evaluated, documented and managed, including development of an analytical database. State the criteria

that will be used by the project team to review and determine the quality of data. To document any quality assurance anomalies, the RFI QC Summary Forms (see Appendix C) must be completed by the analytical laboratory and submitted as part of the RFI Report. In addition, provide examples of any other forms or checklists to be used.

Identify and discuss personnel and data management responsibilities, all field, laboratory and other data to be recorded and maintained, and any statistical methods that may be used to manipulate the data.

8. References

Provide a list of references cited in the RFI Workplan.

C. RCRA Facility Investigation Report

An RFI Report must be prepared that describes the entire site investigation and presents the basic results. The RFI Report must clearly present an evaluation of investigation results (e.g., all potential contaminant source areas must be identified, potential migration pathways must be described, and affected media shown, etc.).

The RFI Report must also include an evaluation of the completeness of the investigation and indicate if additional work is needed. This work could include additional investigation activities and/or interim corrective measures to stabilize contaminant release areas and limit contaminant migration. If additional work is needed, a Phase 2 RFI Workplan and/or Interim Corrective Measures Workplan must be submitted along with the RFI Report.

At a minimum, the RFI Report must include:

- A summary of investigation results (include tables that summarize analytical results).

- A complete description of the investigation, including all data necessary to understand the project in its entirety including all investigative methods and procedures.

- A discussion of key decision points encountered and resolved during the course of the investigation.

- Graphical displays such as isopleths, potentiometric surface maps, cross-sections, plume contour maps (showing concentration levels, isoconcentration contours), facility maps (showing sample locations, etc.) and regional maps (showing receptor areas, water supply wells, etc.) that

describe report results. Highlight important facts such as geologic features that may affect contaminant transport.

- Tables that list all chemistry data for each matrix investigated.

- An analysis of current and existing ground water data to illustrate temporal changes for both water chemistry and piezometric data (use graphics whenever possible).

- A description of potential or known impacts on human and environmental receptors from releases at the facility.

- A discussion of any upset conditions that occurred during any sampling events or laboratory analysis that may influence the results. The discussion must include any problems with the chain of custody procedures, sample holding times, sample preservation, handling and transport procedures, field equipment calibration and handling, field blank results that show potential sample contamination and any field duplicate results that indicate a potential problem. Summary tables must be provided that show the upset condition and the samples that could be impacted. The RFI QC Forms (see Appendix C) must be completed by the analytical laboratory and submitted as part of the RFI Report.

- Assessment of the entire QA/QC program effectiveness.

In addition to the RFI Report, DTSC may require the Respondents to submit the analytical results (database) on a floppy disk (DTSC will specify the format). All raw laboratory and field data (e.g., analytical reports) must be kept at the facility and be made available or sent to the Department upon request.

ATTACHMENT 2

SCOPE OF WORK FOR HEALTH AND SAFETY PLAN

The Department of Toxic Substances Control (Department) may require that the Owner/Operator or Respondent prepare a Health and Safety Plan for any corrective action field activity (e.g., soil or ground water sampling, drilling, construction, operation and maintenance of a treatment system, etc.). The Health and Safety Plan must, at a minimum, include the following elements:

1. Objectives

   Describe the goals and objectives of the Health and Safety Plan (must apply to on-site personnel and visitors). The Health and Safety Plan must be consistent with the facility Contingency Plan, OSHA Regulations, NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985), all state and local regulations and other Department guidance as provided.

2. Hazard Assessment

   List and describe the potentially hazardous substances that could be encountered by field personnel during field activities.

   Discuss the following:

   X Inhalation Hazards
   X Dermal Exposure
   X Ingestion Hazards
   X Physical Hazards
   X Overall Hazard Rating

   Include a table that, at a minimum, lists: Known Contaminants, Highest Observed Concentration, Media, Symptoms/Effects of Acute Exposure.

3. Personal Protection/Monitoring Equipment

   For each field task, describe personal protection levels and identify all monitoring equipment.

   Describe any action levels and corresponding response actions (i.e., when will levels of safety be upgraded).

   Describe decontamination procedures and areas.

4. Site Organization and Emergency Contacts

List and identify all contacts (include phone numbers). Identify the nearest hospital and provide a regional map showing the shortest route from the facility to the hospital. Describe site emergency procedures and any site safety organizations. Include evacuation procedures for neighbors (where applicable).

Include a facility Map showing emergency station locations (first aid, eye wash areas, etc.).

ATTACHMENT 3

COMMUNITY PROFILE OUTLINE

FOR _____

The following items should be included in the Community Profile:

SITE DESCRIPTION

- Description of proposed project.
- Map.
- Description of the site/facility location.
- Description of the surrounding land uses and environmental resources (including proximity to residential housing, schools, churches, etc.).
- Visibility of the site to neighbors.
- Demographics of community in which the site is located (e.g., socioeconomic level, ethnic composition, specific language considerations, etc.). This information may be found in local libraries (e.g., census records).

LOCAL INTEREST

- Contacts with community members - any inquiries from community members, groups, organizations, etc. (include names, phone numbers, and addresses on the key contact list).
- Community interactions - any current meetings, events, presentations, etc.
- Media coverage - any newspaper, magazine, television, etc., coverage.
- Government contacts - city and county staff, state and local elected officials.

KEY CONTACT LIST

- Names, addresses, and phone numbers of city manager, city/county planning department staff, local elected officials, and other community members with whom previous contact has been made.

PAST PUBLIC INVOLVEMENT ACTIVITIES

- Any ad hoc committees, community meetings, workshops, letters, newsletters, etc., about the site or similar activity.

KEY ISSUES AND CONCERNS

- Any specific concerns/issues raised by the community regarding the

site/facility or any activities performed on the site/facility.

- Any anticipated concerns/issues regarding the site/facility.
- Any general environmental concerns/issues in the community.

PP Review _____ Date_____

ATTACHMENT 4

SCOPE OF WORK FOR PROGRESS REPORTS

Progress Reports shall, at a minimum, include the following information:

1. A description of significant activities and work completed during the reporting period;

2. A summary of any findings made during the reporting period;

3. Summaries of all problems or potential problems encountered during the reporting period;

4. Actions taken and/or planned to rectify problems;

5. All projected work for the next reporting period;

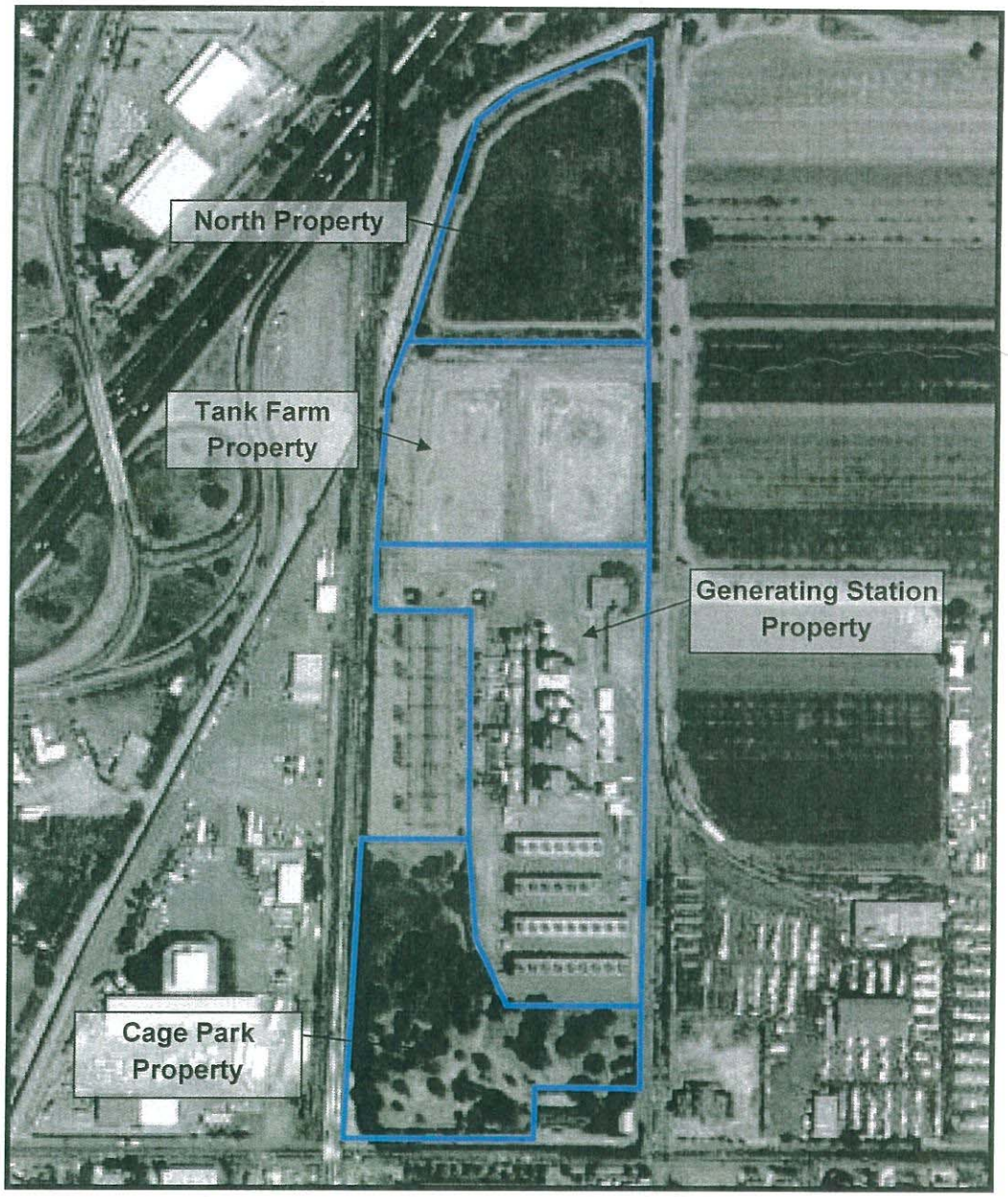
6. A discussion of any changes in personnel that occurred during the reporting period;

7. Summaries of all contacts with representatives of the press, local community or public interest groups during the reporting period;

8. Summary of treatment system effectiveness. Provide a comparison of treatment system operation to predicted performance levels (applicable only if there is an operating treatment system); and

9. If requested by DTSC, the results of any sampling tests and/or other data generated during the reporting period.

EXHIBIT A



Photograph Reference: USGS 2002

Area boundary lines are approximate

N

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES.

EXHIBIT A

Former SCE Highgrove Generating Station
12700 Taylor Avenue
Grand Terrace, San Bernardino County, California

Project Mngr: CO	Terracon 3189 F Airway Avenue Costa Mesa, California 92626 714-444-2322 Fax: 714-444-2110	Project No.	60067065
Designed By: JO		Scale:	
Checked By: JO		Date:	8/2302006
Approved By: CO		Drawn By:	NA
File Name: \60067065\Consent Agreement Exhibit A		Figure No.	A

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ENERGY
COMMISSION

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ELECTRONIC PROOF OF SERVICE LIST
Established 8/2/06

AES HIGHGROVE Power Plant Project
APPLICATION FOR CERTIFICATION,
DOCKET NO. 06-AFC-2

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I declare that transmission via electronic mail was consistent with the requirements of California Code of Regulations, title 20, sections 1209, 1209.5, and 1210. All electronic copies were sent to all those identified on the Proof of Service list above. I declare under penalty of perjury that the foregoing is true and correct.

John L. Carrier, J.D.
Program Manager
CH2M HILL