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DOCKET	
08-AFC-8	
DATE	NOV 11 2009
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November 11, 2009

Rod Jones
California Energy Commission
1516 Ninth Street, MS 15
Sacramento, CA 95814

RE: Hydrogen Energy California Project
Application for Certification 08-AFC-8

On behalf of Hydrogen Energy International LLC, the applicant for the above-referenced Hydrogen Energy California AFC, we are pleased to submit the enclosed document:

- Thirteen copies of the *Responses to CEC Data Requests Set One (#1-132)*
- One CD of the *Responses to CEC Data Requests Set One (#1-132)*

The enclosed document has also been submitted to the Dockets Unit.

URS Corporation

Dale Shileikis
Vice President, Environmental Services

Enclosures

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Responses to CEC Data Requests Set One (#1–132)

Revised Application for Certification (08-AFC-8)

for

HYDROGEN ENERGY CALIFORNIA Kern County, California

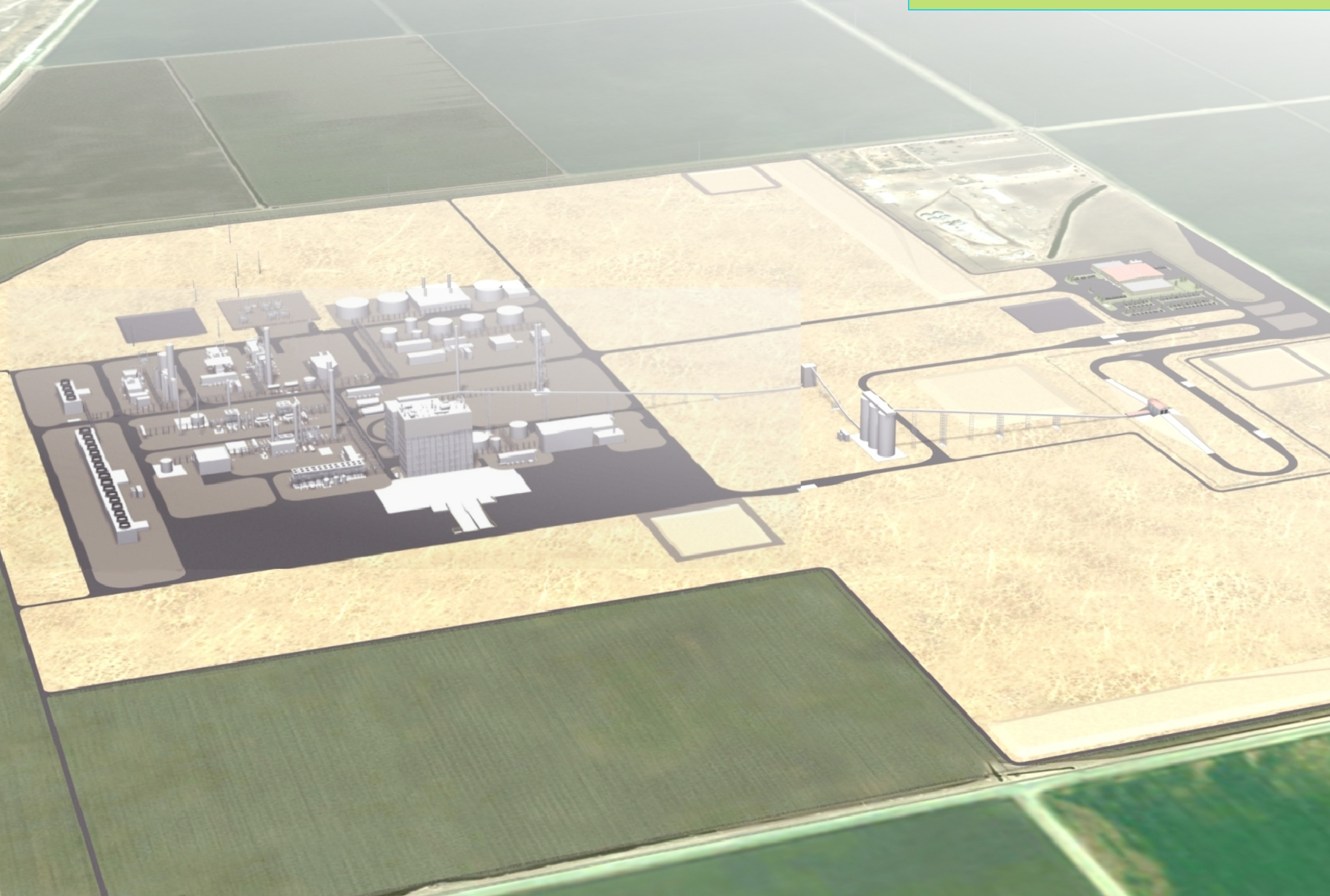
Prepared for:
Hydrogen Energy International LLC

hydrogen energy

Submitted to:
California Energy Commission

Prepared by:
URS

November 2009



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LIST OF ACRONYMS AND ABBREVIATIONS USED IN RESPONSES

AFC	Application for Certification
ARB	Air Resources Board
BACT	best available control technology
BOP	balance of plant
Btu	British thermal units
BVWSD	Buena Vista Water Storage District
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CEC	California Energy Commission
CF	cubic feet
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CRHR	California Register of Historic Resources
CTG	combustion turbine generator
CY	cubic yards
DESCP	Drainage, Erosion, and Sediment Control Plan
DLN	dry low nitrogen oxide
DOE	U.S. Department of Energy
DOE-NETL	Department of Energy-National Energy Technology Laboratory
DPM	diesel particulate matter
EDTA	ethylene diamine tetra-acetic acid
EMS	Emergency Medical Services
EOR	enhanced oil recovery
ERPG	Emergency Response Planning Guideline
GCR	General Conformity Rule
GE	General Electric
GEE	General Electric Energy
GHG	greenhouse gas
gpd	gallons per day
H_2S	hydrogen sulfide
HDD	horizontal directional drilling
HECA	Hydrogen Energy California
HHV	higher heating value
hp	horsepower
hr	hour
HRSG	heat recovery steam generator
I-5	Interstate 5
IDLH	Immediately Dangerous to Life and Health
IGCC	Integrated Gasification Combined Cycle
ITP	Incidental Take Permit
kg	kilograms
lb	pounds
LSAA	Lake and Streambed Alteration Agreement
mgd	million gallons per day
MHI	Mitsubishi Heavy Industries
µm	micrometers
MMBtu	million British thermal units per hour
MW	megawatts

NAHC	Native American Heritage Commission
NGCC	Natural gas combined-cycle
NM_3	Normal cubic meter
N_2O	nitrous oxide
NOI	Notice of Intent
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPRC	Nippon Petroleum Refining Company
NSR	New Source Review
OCA	Offsite Consequence Analysis
OEHI	Occidental of Elk Hills, Inc.
OTC	once-through cooling
PCC	Portland Cement Concrete
PDS	Prevention of Significant Determination
PG&E	Pacific Gas and Electric Company
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PPE	personal protective equipment
ppm	parts per million
ppmc	parts per million by volume, dry basis, corrected to 15 percent O_2
ppmvd	parts per million volumetric dry
PSD	Prevention of Significant Determination
psig	per square inch gauge
RMP	Risk Management Program
ROG	reactive organic gases
ROW	right-of-way
RWD	Report of Waste Discharge
SCAQMD	South Coast Air Quality Management District
SCC	Source Classification Code
SCR	selective catalytic reduction
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SoCalGas	Southern California Gas Company
SRU	Sulfur Recovery Unit
STG	steam turbine generator
SWPPP	Storm Water Pollution Prevention Plan
TACs	toxic air contaminants
TDS	total dissolved solids
TGTU	tail gas treating unit
TiO_2	Titania
TSP	trisodium phosphate
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compounds
WDR	Waste Discharge Requirement
WKWD	West Kern Water District
yr	year
ZLD	zero liquid discharge

INTRODUCTION

This document presents responses to the California Energy Commission's (CEC's) Data Requests Set 1 (Nos. 1 through 132), received from the CEC on the Revised Application for Certification (AFC) for the Hydrogen Energy California (HECA) Project. There have been refinements made to some project linear facilities in consideration of potential impacts to environmental resources. These refinements are described below:

- The transmission route alternatives 1 and 2 as described in the Revised AFC have been modified (shown as transmission routes 1A and 1B on Figure 1).
- The Applicant has identified the preferred carbon dioxide (CO_2) pipeline alignment, as shown on Figure 1. This alignment was selected because the majority of the alignment is located along existing access roads. This alignment is a combination of the CO_2 pipeline alignments analyzed in the Revised AFC.
- The boundaries of the well field have been substantially reduced, as shown on Figure 1.

These revisions have been incorporated into the responses to the Data Requests, as appropriate.

(FIGURE 1)

Technical Area: Air Quality
Author: William Walters

BACKGROUND

In order to evaluate the air quality impacts from this project the baseline conditions of the Project Site need to be understood.

DATA REQUEST

1. Please describe the types of activities that emit combustion and fugitive dust emissions on the site currently and the quantities of the criteria pollutant emissions that occur from those activities.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

2. Please describe whether those activities will be permanently discontinued from the entire project site when the project is completed and estimate the reductions from the current onsite baseline emissions.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

The construction fugitive dust emission calculations appear to be incomplete and do not use assumptions that appear relevant for the project site. The construction requirements at this site for this project are extensive and the site appears to have very fine soils, so the fugitive dust emission calculations should reflect the real construction needs and conditions for this project. Staff needs the applicant to revise these calculations to include all fugitive dust activities and include reasonable calculation assumptions, and then revise the construction PM10 and PM2.5 modeling assessments.

DATA REQUEST

3. Please add the following fugitive dust activity emissions, based on the equipment list provided, to the fugitive emission calculations.

- ***a. Dozing (AP-42, Section 11.9)***
- ***b. Scraping (AP-42, Section 11.9)***
- ***c. Grading (AP-42, Section 11.9)***

RESPONSE

Fugitive dust emissions were calculated using the emission factors described above from the U.S. Environmental Protection Agency's (U.S. EPA's) AP-42 guidance. The supporting documentation for this data response is included as Attachment 3-1, and it shows the calculations and parameters used with the corresponding emission factors. The resulting emissions are summarized in the tables below. The tables summarize the fugitive dust emissions from all fugitive-dust–generating activities (dozing, scraping, grading, material handling, stockpile wind erosion, and travel on unpaved roads) from Months 1 through 12, the months during which dozers, scrapers, and graders would be used on site.

Note that the fugitive dust calculation provided in Section 5.1.2.4 of the Revised AFC is for Month 21. Although this month has the most equipment on site, the three pieces of equipment listed above would not be operating. Therefore, the emissions in Tables 3-1 and 3-2 represent those for Month 1 for maximum short-term emissions, and Months 1-12 for annual emissions.

Table 3-1
Total Annual Fugitive Dust from Onsite Equipment – Month 1

Activity	PM_{10} Emissions (lbs/day)	$PM_{2.5}$ Emissions (lbs/day)
Grading	0.4362	0.0354
Bulldozing	51.0596	16.9147
Dirt Piling	1.0832	0.1640
Storage Piles	1.6313	0.3393
Travel on Unpaved Roads	6.7567	1.4324
Total	**60.97**	**18.89**

Table 3-2
Total Annual Fugitive Dust from Onsite Equipment – Months 1-12

Activity	PM_{10} Emissions (tons/yr)	$PM_{2.5}$ Emissions (tons/yr)
Grading	0.3498	0.0283
Bulldozing	4.6805	1.5505
Dirt Piling	0.0357	0.0054
Storage Piles	0.4763	0.0991
Travel on Unpaved Roads	9.2005	1.9505
Total	**14.74**	**3.63**

ATTACHMENT 3-1

DATA REQUEST

4. Please revise all fugitive dust calculations that require a silt content assumption to use a reasonable site specific silt content value where graveling or paving is not implemented, which based on the geotechnical report in the AFC would be around 50 percent.

RESPONSE

The fugitive dust calculations presented in responses to Data Requests 3a, 3b, and 3c have incorporated a 50 percent silt content. In addition, the fugitive dust calculations for the Month 21 short-term average and the Months 17 through 28 annual average are presented in Tables 4-1 and 4-2 below. Supporting emission factor parameters and calculations are provided in Attachment 4-1.

Table 4-1
Total Fugitive Dust from Onsite Equipment – Month 21

Activity	PM_{10} Emissions (lbs/day)	$PM_{2.5}$ Emissions (lbs/day)
Dirt Piling	1.2298	0.2558
Storage Piles	1.6313	0.3393
Travel on Unpaved Roads	0.3364	3.3641
Total	**3.20**	**3.96**
lbs = pounds		

Table 4-2
Total Annual Fugitive Dust from Onsite Equipment – Months 17 – 28

Activity	PM_{10} Emissions (tons/yr)	$PM_{2.5}$ Emissions (tons/yr)
Dirt Piling	0.0357	0.0054
Storage Piles	0.4763	0.0991
Travel on Unpaved Roads	4.1274	0.8750
Total	**4.64**	**0.98**

ATTACHMENT 4-1

DATA REQUEST

5. The calculations provided for unpaved road travel assume graveled roads. Please indicate if the applicant is planning to gravel the entrance and exits roads, parking areas, and lay down areas at the site during construction.

RESPONSE

The Applicant will gravel the entrance and exit roads, parking areas, and laydown area roads at the Project Site during construction.

DATA REQUEST

6. Please revise the construction PM10 and PM2.5 emission modeling analysis to include these revised fugitive dust emission calculations.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

In general, staff is satisfied with the applicant's off-road equipment emissions calculations. However, the horsepower assumptions for equipment primarily used in the initial grading phase of the site construction, where there will be a substantial amount of cut and fill do not appear appropriate. Staff needs the applicant to revise the equipment horsepower and emission for equipment sized appropriately for the amount of cut and fill necessary at this site.

DATA REQUEST

7. Please review the horsepower assumptions for the D10R dozer, the scraper, and the loader assumed in the emission calculation and revise as necessary for the type of equipment specified (D10R dozer is 580 hp, and scrapers are generally closer to or over 500 hp; well over the 250 hp assumed) or as necessary based on the work level needed for the site construction.

RESPONSE

The horsepower ratings for the equipment types mentioned and several other equipment types were re-evaluated and the following changes were made: the horsepower (hp) rating for the D10R dozer was increased from 250 hp to 500 hp; the horsepower rating for the scraper increased from 250 hp to 500 hp; the horsepower rating for the loader was unchanged at 120 hp; the horsepower rating for the articulating boom platform was decreased from 120 hp to 50 hp; and the exhaust emissions from the concrete vibrators and the fusion welders were eliminated, because they are electric. All other equipment types were unchanged.

There were no scrapers or bulldozers active in Month 21 or in the 12-month period of Months 17 – 28, which are the peak month and peak year, respectively; so these changes did not affect the worst-case modeling for equipment emissions. Therefore, that modeling has not changed. Note that the construction activity for the HECA Project is unlike natural gas combined-cycle (NGCC) projects in that the highest equipment use period comes not from site preparation activities, but later in the construction process when more heavy lift cranes and other equipment are operating (in this case from construction Months 17 – 28).

BACKGROUND

The AFC has not provided a list of specific emission reduction credits (ERCs) proposed to be used to offset this project's criteria pollutant emissions. Staff needs this information to complete its analysis, and the San Joaquin Valley Air Pollution Control District (SJVAPCD) needs this information in order to complete the Determination of Compliance (DOC).

DATA REQUEST

8. Please provide the list of ERC certificates or ERC banking activities that will be proposed to offset the project's emissions, along with each ERC certificate's quarterly amount, originating facility name and address, method of emission reduction, and date of reduction.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

As reported in the Applicant's Status Report No. 1, effective October 15, 2009, the Applicant entered into a transaction with Big West of California LLC to acquire all of the SO_x emission reductions credits (ERCs) and nearly all of the NO_x ERCs (241 tons) required for the HECA Project. The Applicant will provide additional information regarding this transaction once the transfer has been completed.

DATA REQUEST

9. Please identify the potential for the creation of new emission reductions, particularly new emission reductions near the project site. This should include a discussion of the potential to shutdown steam boilers owned by Occidental whose need may be displaced by this projects' carbon dioxide (CO_2) injection.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

BACKGROUND

The operations fugitive dust emission calculations appear to assume all travel is on paved roads. A review of the AFC did not find information to support that assertion, so staff needs additional information for the onsite roads construction.

DATA REQUEST

10. Please indicate if all onsite roads will be paved and whether all onsite travel will be restricted to paved roads.

RESPONSE

During normal operations of the HECA Project, all routine vehicular traffic is anticipated to travel almost exclusively on paved roads. See Figure 2-42, *Preliminary Paving Plan,* in the Revised AFC indicating locations of paved roads.

BACKGROUND

The AFC does not provide energy and mass balances that are necessary for staff to fully understand the gasification technology and its emission sources. Additionally, some technical details on the gasification process need clarification. Staff needs this information to understand the process and complete both its criteria pollutant impact analysis and its greenhouse gases (GHG) impact analysis.

DATA REQUEST

11. Please provide energy and mass balance data for the gasification process for both petroleum coke and coal. The mass balance data should clearly show carbon, water, sulfur, volatile organic compounds (VOC), toxic air contaminants (TACs), and total solids contents throughout the process.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

12. Please indicate the gasifier turndown ratio and the speed and ability for the gasifier to turndown operations when there are CO_2 injection upsets requiring use of the CO_2 vent.

RESPONSE

The HECA Project will have two gasifiers operating at full load during normal operation. Each of the gasifiers is designed to operate at a minimum load of 70 percent, and will be able to reduce to this level in approximately one half hour.

Although a CO_2 injection upset requiring the use of a CO_2 vent is an unlikely emergency event, the plant design allows the reduction in hydrogen-rich fuel production associated with the gasifiers being turned down to be replaced with natural gas co-firing in the Combustion Turbine Generator (CTG) in order to satisfy contractual power supply obligations. When the total CO_2 emissions are considered, reducing the gasifier load to 70 percent only reduces the overall CO_2 emissions by about 23 percent. Consequently, whether it is desirable to turn down the gasifiers following a CO_2 upset event will depend on a variety of factors, including the expected duration of the event, the determination of the cause of the event and the requirement to maintain full power production.

Please see response to Data Request 45 for additional information.

DATA REQUEST

13. a. Please discuss how the gas turbine and duct firing fuel operating system will accommodate variations, particularly short-term spikes upward and downward in gasifier flow and heat content.

b. Please discuss how the diluents gas and natural gas fuel input would compensate for gasifier output fluctuations to provide consistent fuel heat input to the gas turbine and duct burners considering that there is no proposed hydrogen fuel storage.

RESPONSE

a. The HECA Project will normally be operated at base load while firing hydrogen-rich fuel in both the gas turbine and heat recovery steam generator (HRSG) duct burners. During base-load operation, variations in hydrogen-rich fuel production will be accommodated by varying the fuel supply to the HRSG duct burners while the gas turbine operation is unaffected.

b. As stated in the response to Data Request 13a, fluctuations in gasifier output normally are handled by varying the flow of fuel to the duct burners. Under these conditions, the flow of fuel to the gas turbine remains relatively constant, and diluent gas is added to maintain the target composition required for the gas turbine. When the gasifier output is less than the flow rate required for gas turbine base load operation, the gas turbine load is reduced to match the available fuel, and the control system adjusts the flow of diluent gas to maintain the target composition.

It is not typical for the gasifier output to fluctuate significantly, but if it should drop below the amount required for emission-compliant gas turbine operation, then natural gas co-firing will be initiated to maintain gas turbine emission compliance, or the gasifiers will be shut down.

It should be noted that the fuel control system will be designed to avoid flaring during these short-term, transient events.

BACKGROUND

The AFC data is not clear on the maximum heat input rates for the CTG and HRSG. Staff needs this information to verify the criteria and GHG emissions estimates and regulatory requirements for the project.

DATA REQUEST

14. Please provide the maximum heat input rate, for each fuel type if different, for the combustion turbine generator (CTG) and the heat recovery steam generator (HRSG) duct burner.

RESPONSE

Notwithstanding its November 2, 2009 request for additional time to address this data request, the Applicant is able to respond at this time.

Table 14-1 contains the maximum fuel energy input rates for the gas turbine and HRSG duct burner for each fuel type. Note that these values may vary by a small amount as the Project develops further and the maximum gasifier output is finalized.

Table 14-1
Maximum Fuel Energy

Maximum Heat Input	Units	Hydrogen-Rich Fuel	Co-Firing	Natural Gas
Gas Turbine	MMBtu/hr [HHV]	2,148	1,007 Hydrogen-Rich Fuel 1,157 Natural Gas 2,164 Total	1,998
HRSG Duct Burner	MMBtu/hr [HHV]	350	500 Natural Gas	500

Notes:

[1] The maximum hydrogen-rich fuel input values for the CTG fuel and the HRSG duct burner do not occur at the same ambient temperature. The maximum total hydrogen-rich fuel production is expected to be 2,430 MMBtu/hr, HHV.

CTG = combustion turbine generator
HHV = higher heating value
HRSG = heat recovery steam generator
MMBtu/hr = million British thermal units per hour

BACKGROUND

The proposed BACT emission concentration level for nitrogen oxide (NOx) is 4 ppm regardless of the assumed fuel. Staff understands that the hydrogen rich fuel does not have an abundance of in practice facilities achieving lower NOx levels, but for natural gas BACT has been established in practice as 2 ppm (parts per million) for large combined cycle gas turbines. Additionally, staff has seen reference to a Japanese Integrated Gasification Combined Cycle (IGCC) facility that has been able to meet a 2 ppm NOx level. Staff needs more information to understand why this proposed facility cannot meet a 2 ppm NOx best available control technology (BACT) limit, particularly when operating with natural gas.

DATA REQUEST

15. Please indicate, in consideration of any international IGCC facilities that are meeting 2 ppm NOx, why this facility would not be able to meet that BACT permit limit when operating on hydrogen rich fuel.

RESPONSE

The Applicant has not been able to confirm CEC's assumption that other international IGCC facilities have either been permitted at 2 parts per million (ppm) NO_X or have demonstrated NO_X levels as low as 2 ppm consistently in commercial operation.

The Applicant is aware of two IGCC facilities in Japan that are using selective catalytic reduction (SCR) controls for NO_X. The first is the Nakoso IGCC demonstration project. This plant has been operating for about 2 years and gasifies bituminous and sub-bituminous coal to produce about 250 megawatts (MW) of electricity using unshifted syngas.

The other facility is at the Negishi Refinery of the Nippon Petroleum Refining Company (NPRC), which began operating in 2003. This plant gasifies a heavy, residual oil (vacuum resid). The resulting unshifted syngas is combusted in a Mitsubishi Heavy Industries (MHI) combined-cycle unit to produce export electricity.

Table 15-1 summarizes the NO_X emission performance for the Nakoso plant and the HECA Project.

Table 15-1
NO_X Emission Performance
Nakoso Plant and the HECA Project

Facility	NO_X Emission Limit (ppm)	NO_X Emission Reported (ppm)
Nakoso Plant	5[1]	3.4 to 3.9[1]
HECA Project	4	TBD

Note:
[1] Nakoso Publication, 2009.
TBD = to be determined

As shown in Table 15-1, the proposed NO_X emission limit for the HECA Project (4 ppm) is lower than the maximum allowable NO_X emissions for the Nakoso plant in Japan (5 ppm). Furthermore, information in the public domain does not explain whether the Nakoso plant's reported level of 3.4 to 3.9 ppm (as publicized in the literature) occurred over a sustained period of time or whether it simply represents the lowest emission achieved for a short duration.

Regarding the Negishi facility, presentations by NPRC in the public domain indicate that the facility has achieved NO_X levels of 2.6 ppm NO_X with unshifted syngas. However, the basis for this statement is unclear, and the Applicant has not been able to establish what NO_X emission levels this plant has achieved on a long-term basis or its maximum allowable emission limits.

The two Japanese IGCCs differ from HECA in many respects: (a) the type of gas turbine (HECA uses General Electric 7FB as compared with both Japanese IGCCs that use MHI); (b) the feedstock (HECA is a slurry feed IGCC while Nakoso is a solid feed IGCC, and the NPRC is a liquid feed IGCC); and (c) the fuel used by the turbines (HECA uses hydrogen-rich fuel while the two Japanese IGCCs use unshifted syngas). As a result, these types of international IGCCs are inappropriate comparisons for BACT purposes.

While not material to the BACT analysis, it should be noted that the HECA Project's proposed NO_X emissions limit of 4 ppm is significantly lower than the emission limits of other domestic and international IGCCs using syngas or natural gas. See Table 15-2 for NO_X emissions of selected domestic and international IGCC units.

Reference

Nakoso Publication, 2009. Second Year Operation Results of CCP's Nakoso 250-MW Air-blown IGCC Demonstration Plant. Yoshitaka Ishibashi Clean Coal Power R&D Co., Ltd. October 6, 2009 (Gasification Technologies Conference, 2009).

JGC Corporation, 2003. NPRC Negishi IGCC Startup and Operation. Gasification Technologies 2003 (Gasification Technologies Conference, 2003).

Table 15-2
Selected Domestic and International IGCC NO_X Emissions

	HECA Kern County	Cash Creek Generation Station	Duke Energy Indiana Duke Edwardsport Generating Station[1]	Taylorville Energy Center[2]	Wabash	Tampa Electric	Sarlux	ISAB	Nuon, Buggenum IGCC
Location	Kern County, California	Henderson County, Kentucky	Knox County, Indiana	Christian County, Illinois	West Terre Haute, Indiana	Polk County, Florida	Sardinia, Italy	Priolo, Sicily, Italy	Buggenum, The Netherlands
Status	AFC submitted	Permit Issued	Permit Issued	Permit Issued	operational	operational	operational	operational	operational
MW	250	770	630	630 (net)	262	250	548	521	253
Project Feedstock	Petcoke & Coal	Coal	Coal	Coal	Bituminous Coal and Pet Coke	Bituminous Coal	Heavy Oil	Refinery Asphalt	Bituminous Coal
Gasifier	GE	Not Specified	GE (Texaco)	Not Specified	CoP E-Gas	GEE	GE	GEE oil gasifiers	Shell
Turbine Feed	Hydrogen Rich Fuel (H_2/N2)	Syngas (H_2/CO)	Syngas (H_2/CO)	Syngas (H_2/CO)	Syngas (H_2/CO)	Syngas (H_2/CO)	Syngas (H_2/CO)	Syngas (H_2/CO)	Syngas (H_2/CO)
Turbine	GE 7FB	GE 7FB	GE 7FB	GE 7FB	7FA	GE 7FA	GE MS9001E gas turbine	Siemens V94.2K	Siemens V94.2

Table 15-2
Selected Domestic and International IGCC NO_X Emissions (Continued)

	HECA Kern County	Cash Creek Generation Station	Duke Energy Indiana Duke Edwardsport Generating Station[3]	Taylorville Energy Center[4]	Wabash	Tampa Electric	Sarlux	ISAB	Nuon, Buggenum IGCC
Summary of NO_X Control Technology	SCR	SCR, Nitrogen Diluent injection	SCR	SCR, Nitrogen Diluent injection	No SCR	No SCR	No SCR	SCR	No SCR
NO_X (syngas/ hydrogen-rich fuel)	4 ppmvd	0.0331 lbs/MMBtu (5 ppmc)	0.027 lbs/MMBtu Syngas	0.034 lbs/MMBtu (5.0 ppmc)	25 ppmvd	25 ppm	29[5] ppm	18* ppm	9 kg/hr (40 mg/Nm_3)
NO_X (natural gas)	4 ppmvd	0.0246 lb/MMBtu	38 lb/hr	0.025 lb/MMBtu	25 ppmvd	N/A (backup fuel is No 2 oil)			N/A

Notes:

1 http://www.duke-energy.com/pdfs/igcc-fact-sheet.pdf
2 http://www.epa.state.il.us/air/permits/electric/index.html
3 http://www.duke-energy.com/pdfs/igcc-fact-sheet.pdf
4 http://www.epa.state.il.us/air/permits/electric/index.html
5 Integrated Gasification Combined Cycle (IGCC) Design Considerations for High Availability Page 3-25 http://mydocs.epri.com/docs/public/000000000001012226.pdf.

lbs/hr = pounds per hour
lbs/MMBtu = pounds per million British thermal units.
lbs/Nm^3 = pounds per Normal cubic meter
mg/Nm^3 = milligrams per Normal cubic meter
ppmc = parts per million by volume, dry basis, corrected to 15 percent O_2

DATA REQUEST

16. Please indicate why when operating on natural gas that this facility, in contrast to the dozen or more other natural gas fired combined cycle gas turbine projects currently operating in California, cannot meet a 2 ppm NOx BACT limit.

RESPONSE

The more recently constructed natural gas combustion turbines use the latest technology dry low nitrogen oxide (DLN) combustors, which are typically guaranteed to achieve 9 ppm NO_X in the turbine exhaust gas when operating with natural gas. The 7FB combustion turbine proposed for the HECA Project must use a diffusion combustor, because a DLN or other low NO_X combustor has not yet been developed for hydrogen-rich fuel, due to its high flame front speed and broad range of combustibility. During periods when hydrogen-rich fuel is unavailable, the HECA Project will fire natural gas to meet contractual requirements. The natural gas must be fired through the same diffusion burner because the General Electric (GE) 7FB syngas offer does not have the option of a separate natural gas DLN combustor. Furthermore, the HECA Project has been designed to use steam injection for NO_X control when in natural gas service. A comparison with other recent IGCCs using SCR would indicate that 4 ppm is an appropriate emission stack concentration for natural gas operation using a diffusion burner. To provide the high level of confidence necessary to meet a 4 ppm permit limit, the HECA Project will plan to achieve very high conversion efficiency in the SCR. Therefore, the Applicant believes that the proposed 4 ppm NO_X level is an appropriate BACT level for the HECA Project and is consistent with other recently permitted IGCCs.

BACKGROUND

The project description does not indicate that there is the potential for any fugitive VOC emissions. However, it is unclear if there are intermediate steps in the gasifier process that would include gaseous or liquid organic products that could result in fugitive VOC emissions.

DATA REQUEST

17. A. Please indicate if there are VOCs created as intermediate products in the gasification process and calculate the potential fugitive VOC emissions from piping components (flanges, valves, pumps, compressors, etc.).

B. Please provide an estimated count of those piping components.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

The cooling tower emission estimate uses what staff believes to be an inappropriate assumption that may underestimate the potential PM2.5 (particulate matter) emissions from the cooling towers. The Applicant uses a factor from a South Coast Air Quality Management District (SCAQMD) website table that indicates only 60 percent of the cooling tower PM10 emissions are PM2.5. This table value assumption comes from the Air Resources Board (ARB) CEIDARS (data base) "unspecified" category that clearly is not specific to cooling towers and has not been technically justified for cooling tower use. Staff believes that, unless the applicant can provide technically justified rationale to lower PM2.5 emissions, it should be conservatively assumed that all particulate from cooling tower drift is PM10 and PM2.5. Staff needs the applicant to revise the cooling tower emission calculations.

DATA REQUEST

18. Please recalculate the cooling tower particulate emissions considering the mist eliminator drift guarantee of 0.0005 percent of recirculating water flow, and assuming that all particulate emissions are both PM10 and PM2.5.

RESPONSE

The factor listed in the SCAQMD guidance indicating that particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) is 60 percent of total particulate matter less than 10 microns in diameter (PM_{10}) (*Updated CEIDARS Table with $PM_{2.5}$ Fractions)* is specified for cooling tower operation and is not specifically mentioned as being based on an "unspecified" category. Table 18-1 is a copy of the SCAQMD table, presented for reference. Furthermore, the Applicant believes that 60 percent is a conservative overestimate of the $PM_{2.5}$ emissions from the cooling towers as discussed below. Therefore, the Applicant wishes to use the 60 percent factor.

In determining PM emissions from cooling towers, the HECA Project conservatively estimated the total PM_{10} emissions by assuming the full concentration of dissolved solids in any exiting water droplets will be converted to airborne PM_{10}, rather than using either the recommended factor provided by the SCAQMD website (PM_{10} emission from cooling towers is 70 percent of the total PM emissions) or the U.S. EPA's AP-42 guidance, which confirms that it is conservative to use the assumption that all dissolved solids in any exiting water droplets will be converted to airborne PM_{10}. Section 13.4.2 of AP-42 states:

> "a conservatively high PM_{10} emission factor can be obtained by multiplying the total liquid drift factor by the total dissolved solids (TDS) fraction in the circulating water and by assuming that, once the water evaporates, all remaining solid particles are within the PM_{10} size range."

Other studies on similar subjects have also suggested that PM_{10} estimates made with the AP-42 assumptions (all particulate emissions is PM_{10}) may exaggerate actual emission rates from cooling towers (Michelleti, 2006). The studies further confirm that the assumption of all particulate emissions is $PM_{2.5}$ is an exaggeration.

For the $PM_{2.5}$ emission estimate, the HECA Project used the CEIDARS factor provided by SCAQMD guidance ($PM_{2.5}$ is 60 percent of total PM_{10}). This assumption is nearly identical to the request to use 100 percent of the PM_{10} as $PM_{2.5}$ if only a 70 percent PM_{10} to total solids factor were used in the initial PM_{10} calculation. For example, if the total solids were calculated to be 10, the PM_{10} would be 7 using the SCAQMD factor, and the $PM_{2.5}$ would be 7 using the approach from this data request. This approach compares well to the $PM_{2.5}$ of 6 using the Applicant's approach. However, both of these approaches are overly conservative, and the Applicant believes that 60 percent is applicable based on the following discussion.

Table 18-1
Updated CEIDARS Table with $PM_{2.5}$ Fractions

Source Classification Code (SCC) Main Category	SCC Subcategory	$PM_{2.5}$ Fraction of Total PM	PM_{10} Fraction of Total PM	$PM_{2.5}$ Fraction of PM_{10}
Asbestos Removal		0.500	0.500	1.000
Asphalt Paving/ Roofing	Fugitive Emissions	0.925	0.960	0.964
	Manufacturing	0.945	0.980	0.964
Burning	Agriculture/Field Crops, Weed Abatement	0.938	0.984	0.954
	Forest Management, Timber and Brush Fire	0.854	0.961	0.889
	Orchard Prunings	0.925	0.981	0.943
	Range Management, Waste Burning	0.932	0.983	0.948
	Unplanned Structural Fires	0.914	0.980	0.933
Cement Manufacturing		0.620	0.920	0.674
Chemical Manufacturing	Fertilizer-Urea	0.950	0.960	0.990
	Organic and Inorganic Chemicals	0.890	0.900	0.989
Coatings, Solvents, Inks And Dyes	Solvent Based	0.925	0.960	0.964
	Water-Based Coating	0.620	0.680	0.912
Consumer Products		0.925	0.960	0.964
Cooking	Baking, Charbroiling, Deep Fat Frying	0.420	0.700	0.600
Cooling Tower		0.420	0.700	0.600
Dry Cleaning		0.925	0.960	0.964
Electroplating	Hexavalent Chrome, Cadmium	1.000	1.000	1.000
	Zinc and Copper	0.925	0.960	0.964
External Combustion	Coal, Coke, Lignite	0.150	0.400	0.375
	Gaseous Fuel-Except Petroleum and Industrial Process Heaters	1.000	1.000	1.000
	Gaseous Fuel – Petroleum and Industrial Process Heater Only	0.930	0.950	0.979
	Liquid Fuel – Except Residual Oil	0.967	0.976	0.991
	Residual Oil – Except Utility Boilers	0.760	0.870	0.874
	Residual Oil – Utility Boilers Only	0.953	0.970	0.982
	Steel Furnace	0.930	0.980	0.949
	Wood/Bark Waste	0.927	0.997	0.930

Table 18-1
Updated CEIDARS Table with $PM_{2.5}$ Fractions (Continued)

Source Classification Code (SCC) Main Category	SCC Subcategory	$PM_{2.5}$ Fraction of Total PM	PM_{10} Fraction of Total PM	$PM_{2.5}$ Fraction of PM_{10}
Fabricated Metals	Abrasive Blasting	0.790	0.860	0.919
	Arc Welding, Oxy Fuel, Copper, Zinc, Bath	0.925	0.960	0.964
Food and Agriculture	Coffee Roasting	0.610	0.620	0.984
	Fermentation, Rendering, Fish and Nut Processing	0.420	0.700	0.600
	Grain Elevators	0.010	0.290	0.034
	Grain Milling, Drying	0.400	0.540	0.741
	Livestock Waste	0.420	0.700	0.600
Fugitive Dust	Agricultural Tilling Dust	0.101	0.454	0.222
	Construction and Demolition	0.102	0.489	0.208
	Landfill Dust	0.102	0.489	0.208
	Livestock Dust	0.055	0.482	0.114
	Paved Road Dust	0.077	0.457	0.169
	Unpaved Road Dust	0.126	0.594	0.212
Fugitive Emissions – Organic and Inorganic	Liquid Fuel Storage/Handling, Loading, Unloading Dispensing	0.925	0.960	0.964
	Natural Gas Production, Crude Oil Production, Petroleum Refining	0.555	0.610	0.910
	Organic and Inorganic Chemcals	0.925	0.960	0.964
	Processing	0.925	0.960	0.964
	Well Cellears, Pumps, Valves, Flages, Seals	0.925	0.960	0.964

Notes:

PM = particulate matter
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns in diameter
SCC = Source Classification Code

A U.S. EPA report provided a calculated estimate on the effect of evaporation on droplet size, which presented an equivalent PM size generation as a function of droplet size (U.S. EPA, 1998) (see Figure 18-1 and Attachment 18-1).

Using manufacturer-provided data on mass distribution of drift droplet size for cooling tower drift dispersed from Marley TU10 and TU12 Excel Drift Eliminators, particulate emissions from the HECA Project cooling towers can be calculated as shown in Table 18-2.

Figure 18-1
Particle Size as Function of Droplet Size

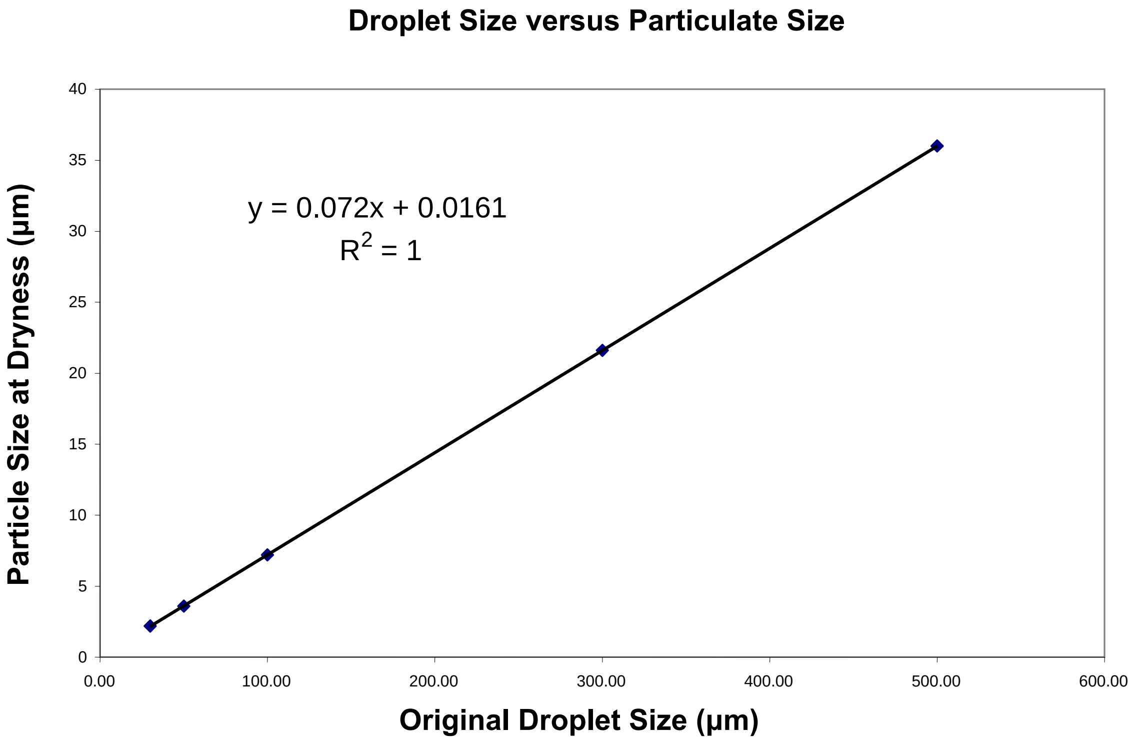


Table 18-2
Cooling Tower Droplet Mass Distribution (U.S. EPA)

Droplet Size (Microns)[1]	Mass Fraction[1]	PM Diameter (Microns)[2]
525	0.2%	37.82
375	1.0%	27.02
230	5.0%	16.58
170	10.0%	12.26
115	20.0%	8.30
65	40.0%	4.70
35	60.0%	2.54
15	80.0%	1.10
10	88.0%	0.74

Notes:

[1] Data provided by Marley for Marley TU10 and TU12 Excel Drift Eliminators. Mass Fraction specifies the fraction of particle with diameter larger than the specified diameter—0.2 percent of the drift will have particle sizes larger than 525 microns.

[2] Correlating particle size at dryness based on the data provided in EPA-450/3-87-010a.

A plot of particle distribution based on the last column of Table 18-2 is shown in Figure 18-2.

As shown in Figure 18-2, $PM_{2.5}$ emissions from cooling tower drift using the U.S. EPA methodology are approximately 40 percent of the total particulate emissions. Figure 18-2 shows that the HECA Project's assumption that $PM_{2.5}$ emissions are 60 percent of the PM_{10} (which was assumed as 100 percent particulates) is indeed conservative.

Another approach to estimating fine particulate emissions from cooling towers based on a representative drift droplet size distribution and TDS in the water was also commonly used (Aull, 1999). This approach was presented at the 94th Annual Air & Waste Management Association's Annual Meeting (June 2001) and presented in the State Water Resources Control Board's Draft Substitute Environmental Document on the Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling as an alternative approach to better estimate fine particulate emissions from cooling towers (Reisman, 2001). By assuming that, shortly after being emitted into ambient air, each water droplet was to evaporate into a single, solid, spherical salt (sodium chloride) particle, particulate emissions from the HECA Project cooling towers can be calculated as shown in Table 18-3.

A plot of the last column in Table 18-3 is shown in Figure 18-3.

Using the second approach based on droplet size from the cooling tower manufacturer, and the approach by Aull (1999), $PM_{2.5}$ emissions from cooling towers is approximately 20 percent of the total particulate emission. This approach showed that the HECA Project's assumption that $PM_{2.5}$ emissions are 60 percent of the PM_{10} (which was assumed as 100 percent particulates) is far more conservative than the expected value.

Figure 18-2
Particulate Mass Distribution Curve (U.S. EPA)

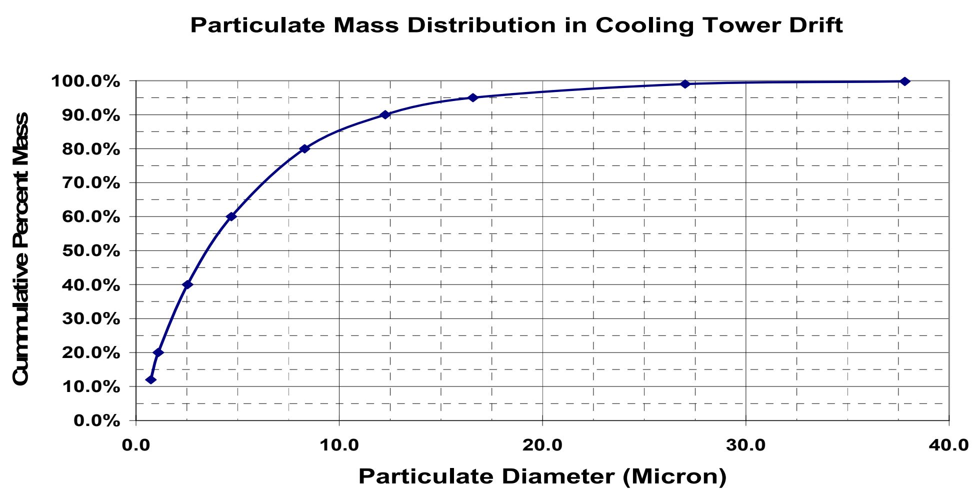


Table 18-3
Cooling Tower Droplet Mass Distribution[1]

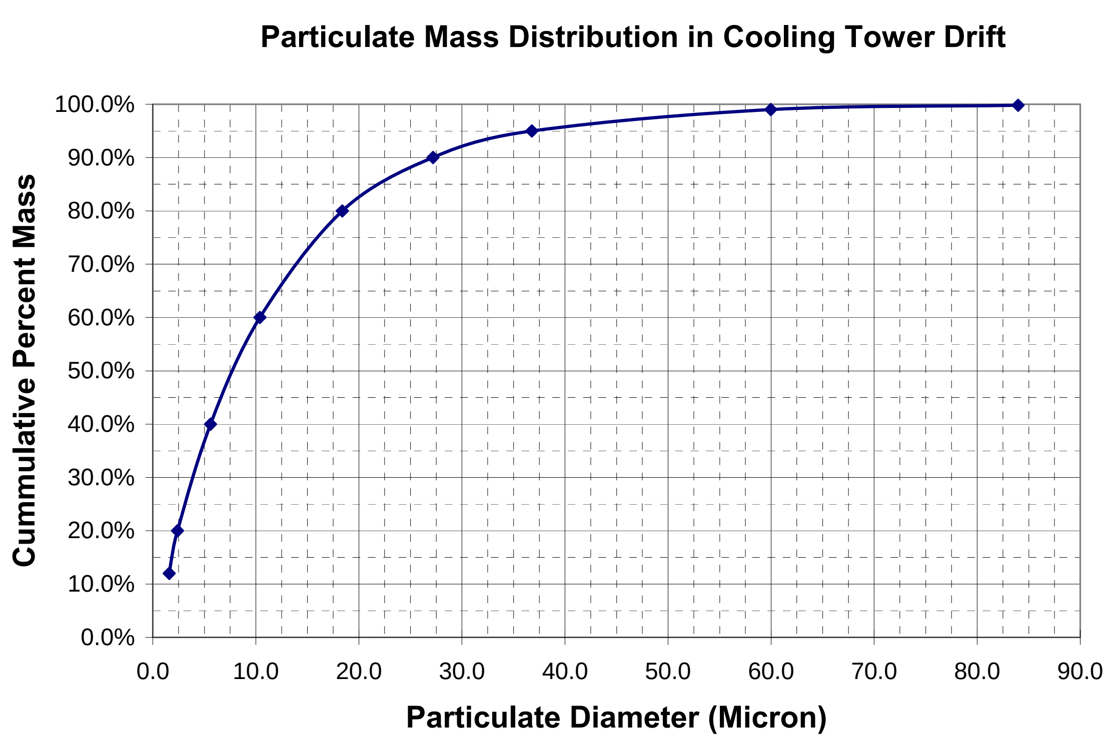
Droplet Size (Microns)[2]	Mass Fraction[2]	PM Diameter (Microns)[1]
525	0.2%	83.97
375	1.0%	59.98
230	5.0%	36.78
170	10.0%	27.19
115	20.0%	18.39
65	40.0%	10.40
35	60.0%	5.60
15	80.0%	2.40
10	88.0%	1.60

Notes:

[1] Correlating particle size at dryness based on the assumption that, shortly after being emitted into ambient air, each water droplet was to evaporate into a single, solid, spherical salt (sodium chloride) particle.

[2] Data provided by Marley for Marley TU10 and TU12 Excel Drift Eliminators. Mass Fraction specifies the fraction of particle with diameter larger than the specified diameter—0.2 percent of the drift will have particle sizes larger than 525 microns.

Figure 18-3 Particulate Mass Distribution Curve



References

Aull, R., 1999. Memorandum from R. Aull, Brentwood Industries, to J. Reisman, Greystone. December 7.

Michelleti, W.C., 2006. "Atmospheric Emissions from Power Plant Cooling Towers." CTI Journal. Vol. 27, No. 1.

Reisman, Joel, and Gordon Frisbie. Calculating Realistic PM_{10} Emissions from Cooling Towers. Greystone Environmental Consultants. *Environmental Progress,* Volume 21, Issue 2.

U.S. EPA, 1998. Chromium Estimate from Comfort Cooling Towers/Background Information for Proposed Standards. Emission Standards Division. EPA-450/3-87-010a.

ATTACHMENT 18-1

BACKGROUND

Staff is aware that the applicant has removed the LMS100 peaking turbine from the project design and that The Applicant will be making other modifications to ensure operating PM2.5 emissions, subject to Federal New Source Review, remain below 100 tons per year. Based on the initial emission estimates for the project, staff believes that it will not be easy to reduce PM2.5 emissions below 100 tons per year. Staff has the following information requests/project design revisions for the applicant to consider while making these project modifications.

DATA REQUEST

19. Please revise the cooling tower operating data as needed to address the reduction in the maximum heat rejection load due to the removal of the LMS100 turbine.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

20. Please indicate if the applicant is willing to increase the onsite water treatment capabilities to substantially reduce the total dissolved solids (TDS) content of the cooling towers' recirculating water.

RESPONSE

The Applicant is unwilling to increase the onsite water treatment capabilities. The Applicant's choice of impaired water as the source of raw water to the plant combined with Zero Liquid Discharge effluent treatment results in a significant environmental benefit. The current onsite water treatment configuration produces a cooling tower circulating water TDS content that balances power consumption, cost-effectiveness, and environmental benefits. Increasing the onsite water treatment capabilities to substantially reduce circulating water TDS would significantly increase capital cost and parasitic energy consumption, thereby reducing the overall efficiency of the HECA Project. Furthermore, this proposed design modification would not result in a substantial corresponding benefit in excess of that already delivered with the existing design. Therefore, the Applicant has determined that a TDS level of 9,000 milligrams per liter in the cooling water circulation is the optimal concentration.

DATA REQUEST

21. Please indicate if the applicant is willing to revise the design to use an air cooled condenser for project cooling.

RESPONSE

The Applicant is unwilling to revise the design to use an air cooled condenser and has conducted a comprehensive air cooling study which provides the basis for this decision (see Revised AFC Appendix X, Water Usage Minimization Study). The Water Usage Minimization Study concluded that air cooling substantially increases capital cost, parasitic energy consumption, and operating cost with a significant reduction in the efficiency of the HECA Project (as much as 25 MW would be lost for summer peak output). Therefore, the Applicant has not selected air cooling as the heat rejection method for the HECA Project.

DATA REQUEST

22. Please indicate if the applicant is willing to reduce the CTG/HRSG PM10/PM2.5 emission factor (18 lbs/hour) to values that would be similar to those used for other recent Frame F gas turbine projects (approximately 9 lbs/hour for non-duct fired operations and 10.5 to 12 lbs/hour for duct fired operations), either through a general reduction in the stipulated emission factor, or by modifying the full time duct firing operating assumption that would allow a reduced non-duct firing emission factor to be used for a substantial portion of the year.

RESPONSE

At this time, the Applicant is not willing to reduce the $PM_{10/2.5}$ emission factor. There are a number of uncertainties involved with the measurement of PM, and consequently turbine manufacturers continue to use conservative emission factors for the basis of their guarantees. In the particular case of the HECA Project, hydrogen-rich fuel (as opposed to syngas) has not been tested with the applicable U.S. EPA methods for filterable and condensable PM. The Applicant would consider reducing the maximum allowable $PM_{10/2.5}$ emission rates for the heat recovery steam generator after sufficient operating experience and source tests indicate that such reduced emission limits would be achievable on a long-term basis.

BACKGROUND

The AFC provides information regarding fuel delivery truck trips, but does not indicate if there are any dedicated onsite vehicles. Staff needs additional information to determine if the operating emissions need to be revised to include dedicated onsite vehicles, and what mitigation the applicant would be willing to stipulate to for these emission sources.

DATA REQUEST

23. Please identify the number, make/model type, vehicle miles traveled (on-road vehicles), or hours of use (off-road vehicles), and fuel type of any necessary dedicated onsite off-road and on-road vehicles.

RESPONSE

Information regarding the make, model, fuel type, and annual use of onsite vehicles is under development and currently not available.

However, an estimate of the fleet of dedicated on-site trucks was developed to allow emissions to be quantified for response to Data Request 24. The fleet is estimated to be 10 light heavy-duty gasoline trucks and 10 light heavy-duty diesel trucks and an on-site average annual usage of 10,000 miles for each truck.

DATA REQUEST

24. Please provide criteria pollutant and GHG emission estimates for the dedicated onsite vehicles emissions related to vehicle use such as including paved and unpaved road dust.

RESPONSE

The Applicant estimates twenty trucks will be dedicated for onsite operational and maintenance use. Because additional information regarding the make, model, fuel type and annual use of the vehicles is currently not available; potential greenhouse gas (GHG) emissions from the trucks were estimated in Table 24-1 as follows:

Table 24-1
Onsite Vehicle Annual Emissions (tons/year)

On-Road Vehicles	#	CO	CO_2	CH_4	N_2O	NO_x	PM_{10}	$PM_{2.5}$	SO_x	ROG[1]
Light Heavy-Duty Gasoline Truck (LHD1-CAT)	10	0.025	129.575	0.004	0.002	0.007	0.024	0.005	0.001	0.004
Light Heavy-Duty Diesel Truck (LHD1-DSL)	10	0.049	57.210	0.001	0.001	0.058	0.025	0.006	0.001	0.007

Notes:

[1] Assuming Reactive Organic Gases (ROGs) are equivalent to Volatile Organic Compounds (VOCs).

Emission factors for on-road vehicles are based on results from EMFAC Emissions Model 2007 Version 2.3 EMFAC Scenario year was 2010, and the selected area was Kern County at an average speed of 15 miles per hour within the HECA facility, and 10,000 miles per year per vehicle within the facility.

PM_{10} emissions include exhaust emissions, brake wear, tire wear, fugitive dust from paved roads (all routine vehicular traffic is anticipated to travel exclusively on paved roads).

Fractional values for $PM_{2.5}$ were taken from the SCAQMD guidance: Final – Methodology to Calculate $PM_{2.5}$ and $PM_{2.5}$ Significance Thresholds, October 2006: Appendix A – Updated CEIDARS Table with $PM_{2.5}$ Fractions.

CH_4 = methane
CO = carbon monoxide
N_2O = nitrous oxide
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in diameter
PM_{10} = particulate matter less than 10 microns in diameter
SO_X = sulfur oxides

DATA REQUEST

25. Please identify if the applicant would be willing to stipulate to a condition of certification that would require a review of available alternative low-emission vehicle technologies, including electric and hydrogen fueled vehicles. Staff needs to know whether the applicant would consider use of those technologies to replace any proposed onsite dedicated diesel and gasoline fueled vehicles used for operations and maintenance if lower emission alternative technology vehicles are both available and not cost prohibitive.

RESPONSE

The Applicant would be willing to stipulate to a condition of certification to review available alternative low-emission vehicle technologies for onsite transportation, including electric and hydrogen-fueled vehicles. The Applicant will consider these technologies to replace any proposed onsite dedicated diesel- and gasoline-fueled vehicles used for operations and maintenance provided the technology is suitable for the task and environment, commercially available, and not cost prohibitive.

BACKGROUND

The applicant provided air basin by air basin fuel hauling emission summaries; however, staff has questions regarding the results, in particular the difference in magnitude for trucking carbon dioxide emissions which increased in all basins versus the criteria pollutant emissions which tended to decrease in all basins, except for the San Joaquin Valley Air Basin. Staff needs to understand the calculation assumptions that provide this unexpected difference between criteria and GHG emissions.

DATA REQUEST

26. Please explain the emission calculation assumptions that create GHG emission increases from petroleum coke hauling in the South Coast and South Central Coast Air Basins while the criteria pollutant emissions are estimated to decrease.

RESPONSE

The apparent inconsistency has been reviewed and the numbers presented in the Revised AFC are confirmed. The explanation is that the difference in criteria pollutant emission factors between the Current Scenario and the HECA Project Scenario is significant, whereas the difference in GHG emission factors between the two scenarios is negligible. Table 26-1 compares the truck fleet emission factors for the Current Scenario and the HECA Project Scenario, and shows that the proposed mitigation measure of using exclusively model year 2010 trucks for the HECA Project Scenario results in lower criteria pollutant emission factors; whereas the CO_2 emission factors show almost no change.

Table 26-1
South Coast Air Basin Emission Summary

Current Scenario	**CO**	**CO_2**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG**
Truck Fleet (1971- 2015) Emission Factor	7.36E-03	4.20	2.01E-02	1.04E-03	8.76E-04	4.08E-05	1.77E-03
Miles Traveled	655,082						
Rail Emission Factor	0.46	170.86	2.56	0.09	0.08	0.25	0.14
Miles Traveled	16,016.60						
Total Emissions (lbs/yr)	12,256.21	5,489,796.86	54,163.63	2,121.59	1,896.88	4,097.38	3,467.36
Total Emissions (tons/yr)	**6.13**	**2,744.90**	**27.08**	**1.06**	**0.95**	**2.05**	**1.73**
HECA Project Scenario	**CO**	**CO_2**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**SO_x**	**ROG**
Truck Fleet (2010 trucks only) Emission Factor	3.55E-03	4.16	7.27E-03	4.07E-04	2.91E-04	2.91E-05	6.69E-04
Miles Traveled	2,306,758						
Total Emissions (lbs/yr)	8,180.94	9,589,139.36	6,764.23	938.80	670.57	67.06	1,542.31
Total Emissions (tons/yr)	**4.09**	**4,794.57**	**8.38**	**0.47**	**0.34**	**0.03**	**0.77**
Note: Emission Factors are in units of pounds per mile.							

Under the Current Scenario in the South Coast Air Basin, the truck fleet is assumed to contain trucks ranging from model year 1971 to model year 2015. The EMFAC model assumes a larger percentage of trucks in the truck fleet are of older model years, as seen in Table 26-1. The model assumes that trucks of an older model year will be more polluting, and therefore the criteria emission rates will be higher.

BACKGROUND

The offsite fuel and waste hauling emissions for this project are substantial. Staff needs to know if the applicant would be willing to stipulate to additional mitigation beyond only contracting 2010 and newer trucks as provided in the AFC.

DATA REQUEST

27. Please identify if the applicant would be willing to stipulate to contracting for only new trucks for fuel delivery at the time of starting operations and maintaining a maximum average fleet age, or some other measures to mitigate this large emissions source.

RESPONSE

The Applicant is willing to commit to only employing trucks that meet or exceed the 2010 heavy diesel emission standards. New diesel trucks are becoming progressively cleaner as a result of California and national emission standards. For example, by 2010, diesel particulate matter and NO_X emissions from new heavy-duty diesel truck engines will be about 98 percent lower than uncontrolled levels.

BACKGROUND

The offsite trip parameter data appear incomplete in terms of specific destination for the outgoing waste and secondary product haul trips. Staff needs the applicant to determine the likely destination for these haul trips and modify the emission calculations appropriately. Additionally, staff needs more information regarding the final disposition for the gasification solids.

DATA REQUEST

28. Please identify likely destinations for the gasification solids, sulfur, and zero liquid discharge (ZLD) filter cake haul trips, and revise the offsite emissions calculations appropriately.

RESPONSE

Gasification Solids

Information regarding composition and quantity of gasification solids can be found in Sections 2.1.9.4 and 5.13.2.2 of the Revised AFC. This product can either be disposed or reused/recycled as described below.

- Disposal method: offsite disposal or reuse/recycle for the following applications (see the response to Data Request 29 for detailed information):
  - Ready-mix Concrete
  - Cement Manufacturing
  - Aggregate application
  - Portland Cement Concrete/road base/flowable fill
  - Sand-blasting application
- Potential destinations for reuse/recycling of gasification solids: See the response to Data Request 115.
- Potential destinations for disposal of gasification solids: See Table 5.13-1 of the Revised AFC.

Molten Sulfur

Information regarding the composition and quantity of molten sulfur can be found in Section 2.1.9.3 of the Revised AFC. This by-product can be sold to chemical manufacturers in Southern California as a raw material for sulfuric acid manufacturing; processed into plant nutrient mix; or converted into soil fertilizer. Potential customers for the material are listed in Table 28-1 which is being submitted under separate confidential cover.

Zero Liquid Discharge Solids Disposal

Information regarding composition and quantity of ZLD solids can be found in Sections 2.1.9.5 and 2.4.5, and Revised Tables 2-20 and 5.13-3 of the Revised AFC. Table 112-2 (Revised Tables 5.13-3 and 2-20) is presented as part of the response to Data Request 112. The likely destinations for ZLD solids include Class I and Class III landfills (depending on the characterization of the material) near the site, as listed in Revised AFC Table 5.13-1. Disposal methods and corresponding destinations are described below.

- Process wastewater ZLD solids
  - Will be tested to characterize as hazardous or nonhazardous.
  - If hazardous, solids will be disposed of at an offsite hazardous waste disposal facility (Class I landfill) as listed in Table 5.13-1.
  - If nonhazardous, the solids will be disposed of at an offsite nonhazardous waste disposal facility (Class III landfill) as listed in Table 5.13-1.
- Plant wastewater ZLD solids
  - Will be nonhazardous
  - Will be disposed of at an offsite non–hazardous-waste disposal facility (Class III landfill) as listed in Table 5.13-1.

Offsite Emissions

With respect to potential impacts to estimated offsite vehicle emissions, the refined destination information in this response will be evaluated to determine if revisions to the air pollutant emissions inventory in the Revised AFC already including these vehicles are necessary.

DATA REQUEST

29. Please indicate if the gasification solids may be used, in a manner like fly ash, for concrete production; or be used for some other beneficial purpose.

RESPONSE

In terms of chemical properties, both fly-ash and gasification solids are similar and can be used interchangeably for cement/concrete mixing and other uses. In the State of California, fly-ash is used extensively in many different applications. This fly-ash demand is met by importing it from other states such as Arizona, Colorado, and Utah. There are some differences that might require minor alterations in how gasification solids are used as compared with fly-ash. Physically, the gasification solids are granular, vitreous, and glassy, with a dark color, while fly-ash is much finer, and light in color. However, gasification solids produced by the HECA Project will potentially provide a substitute for fly-ash in these various applications and also reduce the need for importing fly-ash from out of state. The bulleted list below presents potential beneficial uses for the HECA Project gasification solids. These uses are also supported by the research conducted by National Energy Technology Laboratory (IEP – Coal Utilization By-Products – Utilization Projects).

- **Ready – Mixed Concrete.** Ready-Mixed Concrete is generally manufactured using Portland cement, sand, gravel, and water. Like fly-ash, gasification solids may be used for cement replacement. The Applicant expects that gasification solids may be used as concrete replacement for up to 15 percent to 20 percent of the Ready-Mixed Concrete (with fly-ash, the replacement is up to 50 percent). The use of gasification solids in concrete can improve workability, lower water requirements, lessen heat hydration, and improve resistance to alkali aggregates and sulfur attack, and reduce permeability.

- **Cement Manufacture.** Gasification solids may be used in the manufacture of cement clinker, which is ground to produce Portland cement. The chemistry of the gasification solids has important elements, such as aluminum, that are needed for cement manufacture and can substitute for raw materials routinely used by cement plants. The specific quantity of gasification solids that can be used in cement manufacture is kiln-specific, but can be up to 3 to 5 percent of the raw feed materials.

- **Aggregate Applications.** Gasification solids can also be used, in a similar manner to crushed stone and gravel, in aggregate and concrete mixing. There are two types of aggregate: fine and coarse. Fine aggregate consists of natural sand or crushed stone with a particles size less than 3/8 inch; coarse aggregate particles range between 3/8 inch and 1½ inch and are made up by gravels and crushed stone. The gasification solids can be used in the fine aggregate mix.

- **Portland Cement Concrete (PCC)/road base/flowable fill.** In highway engineering, gasification solids can be mixed with other materials to produce PCC, road base, flowable fills, grouts, and asphalt filler. Gasification solids are mostly used as a pozzolan in PCC applications and as mineral filler in hot-mix asphalt application to improve the fluidity of flowable fill and grout.

- **Sandblasting.** Gasification solids can be processed to manufacture a sandblasting grit that is used for metals sandblasting. The coarse fraction of the solids is hard, and offers good properties as a sandblasting material.

- **Closed-Loop Recycling in Place.** As discussed in Section 2.2.3 of the Revised AFC, the high-carbon fine particles will be recycled internally by a closed-loop recycling process to minimize the generation of material. Gasification products generated from the gasification process will be segregated into a fraction containing mostly high-carbon fine particles, and another fraction containing mostly low-carbon and high-ash coarse particles. High-carbon fine particles after segregation will be recovered and recycled back through the gasification process, while low-carbon high-ash coarse particles will be dried out and exit the gasifier process. It is estimated that a significant fraction of the gasification products with fuel value can be segregated in the recycling process and returned for reuse in the gasification process, and the remaining high-ash coarse particles without fuel value will become gasification solids as a final product. This reuse process results in significant recycling, and limits the amount of solids produced for offsite use or disposal.

BACKGROUND

The AFC notes that the applicant is proposing to use Tier 4 emergency engines, with very low NOx emission levels. However, but the data supplied to the San Joaquin Valley Air Pollution Control District (SJVAPCD) as part of the response to the SJVAPCD notice of incomplete application provides engine information that does not substantiate the emission levels provided in the AFC. Staff needs confirmation that the applicant will obtain Tier 4 engines and will stipulate to the emission levels provided in the AFC.

DATA REQUEST

30. Please confirm that the emergency engines will meet Tier 4 emission standards, and will meet the more stringent emission levels provided in the AFC.

RESPONSE

The Applicant stipulates that the emergency fire water pump diesel engine and the two emergency generator diesel engines will be in full compliance with the requirements of the applicable California Air Resources Board (CARB) Tier 4 levels based on the date of manufacture and horsepower rating of the engines. These CARB requirements are found at http://www.arb.ca.gov/msprog/offroad/off-road-stds.xls, and provided as Attachment 30-1.

Emission limits more stringent than the Tier 4 levels for the emergency generator diesel engines were inadvertently included in the Revised AFC. The Applicant requests that the applicable CARB off-road engine Tier 4 standards be used as the maximum allowable emission limits for these engines.

ATTACHMENT 30-1

BACKGROUND

The AFC does not show any gasoline diesel storage for vehicle refueling. Staff would like to confirm that the applicant does not plan to store gasoline or diesel for vehicle refueling.

DATA REQUEST

31. a. Please confirm that there will be no gasoline or diesel vehicle refueling storage at the site and that the onsite dedicated gasoline or diesel fueled vehicles will have to drive to the nearest gasoline station for fueling. The nearest station which is about 15 miles round trip from the site.

b. Alternatively, or provide information for any proposed onsite gasoline storage and refueling facilities including throughput information and permitting requirements.

RESPONSE

a. The Applicant confirms that the current design of the HECA Project does not include onsite bulk gasoline or diesel vehicle fuel storage. Because it is not practical to fuel the HECA Project's on-road, nonroad, and stationary engines off site, fuel will be brought to the site on an as-needed basis by a commercial fueling contractor licensed to do business in the State of California.

b. As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request to confirm the current design will not change.

BACKGROUND

The AFC, page 5.1-70, indicates that the results of a cumulative impacts analysis will be provided under separate cover and that Appendix J provides a list of projects located within 6 miles of the site from the SJVAPCD. However, staff's review indicates that Appendix J contains a list of projects from Kern County and not stationary source projects from the SJVAPCD. Staff needs the applicant to obtain the project list from the SJVAPCD and complete the cumulative impacts analysis.

DATA REQUEST

32. Please provide a list from the SJVAPCD of large stationary source projects with permitted emissions, for projects with greater than 5 tons of permitted emissions of any single criteria pollutant, located within six miles of the project site that have been recently permitted, but did not start operation prior to 2009, or are in the process of being permitted.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

33. Please provide a cumulative impacts modeling analysis in consultation with Energy Commission staff based on the project list provided by SJVAPCD.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

The applicant provided additional emission data for various plant commissioning activities but did not provide a schedule to determine which activities would overlap. Staff needs to determine if the worst-case commissioning modeling analysis includes all of the emission sources necessary for worst-case conditions.

DATA REQUEST

34. Please provide a schedule for the commissioning of the CTG/HRSG and the balance of plant equipment in order to identify the worst-case overlapping short-term emission conditions.

RESPONSE

Attachment 34-1, HECA Preliminary Commissioning Schedule, depicts the primary activities that will produce emissions and their expected sequence. The durations depicted by the bars reflect the overall activity and not the duration of any emissions that are intermittent and of shorter duration. The schedule is divided into four general categories that occur in sequence with some overlap of activities:

1. Commissioning Utility and Support Systems

Commissioning the utility and support systems includes electric power, water treating, natural gas, and cooling tower, as well as the safety systems that will be needed to support initial operations of the equipment. Commissioning the Diesel Firewater Pump and the Emergency Diesel Generators will produce air emissions during initial operation and testing. The Auxiliary Boiler will also be commissioned during this time period.

2. Power Block Commissioning on Natural Gas

It is essential for the power block to operate reliably on natural gas before commissioning on hydrogen-rich fuel can take place. The natural gas commissioning sequence for the power block is similar to a conventional natural gas combined-cycle plant and is described detail in Table 5.1-21 of the Revised AFC.

3. Gasification Block Commissioning

The commissioning sequence for the Gasification Block generally follows the process flow path (feedstock and fluxant handling, Gasification, Shift, Low-Temperature Gas Cooling, Mercury Removal, Acid Gas Removal, Sulfur Recovery, Tail Gas Treating, and CO_2 compression). The Gasification, Rectisol, and Sulfur Recovery Unit (SRU) Flares will be functionally tested with natural gas and nitrogen. The Tail Gas Thermal Oxidizer will be commissioned on natural gas. The Revised AFC Supplement, Appendix A3, Table A3, shows the annual emissions for the Gasification and balance of plant (BOP) systems by source.

4. Power Block Commissioning on Hydrogen-Rich Fuel

The power block will already be operating reliably on natural gas with full emission control and monitoring. The hydrogen-rich fuel and nitrogen blending systems will be commissioned at this time, which will result in some flaring of hydrogen-rich fuel. The CTG combustors will need to be tuned for hydrogen-rich fuel and for the allowable hydrogen-rich fuel/natural gas blends. The CTG will be performance-tested on hydrogen-rich fuel. The power block will be functionally tested on hydrogen-rich fuel, co-firing with natural gas and at reduced loads down to the emission compliance limits. Plant-wide testing on 100 percent petcoke and 75 percent coal/ petcoke blends will also be required to verify the plant is ready for commercial operation. The hydrogen-rich fuel commissioning sequence for the power block is described in detail in Table 5.1-21 of the Revised AFC.

Worst-Case Overlapping Short-Term Emissions

The commissioning schedule requires the BOP facilities and the power block (on natural gas) to be fully functional and operating with full emission controls prior to operating the gasifiers. Therefore, the peak emissions associated with commissioning the power block on natural gas, the Emergency Diesel Generators, the Diesel Firewater Pump, and the Auxiliary Boiler will not overlap with the emissions associated with commissioning the Gasification Block.

The power block is expected to operate on natural gas during the commissioning of the Gasification Block. This could result in concurrent operation of the Gasification Flare and CO_2 vent with normal power block operation.

ATTACHMENT 34-1

DATA REQUEST

35. Please identify if the applicant would be willing to stipulate to any commissioning constraints to prevent overlap and minimize the worst-case short-term emissions during plant commissioning.

RESPONSE

The Applicant is willing to consider and work with the CEC on an appropriate condition to prevent overlap and minimize worst-case short-term emissions during plant commissioning, provided operability and safety issues are appropriately addressed.

BACKGROUND

The applicant has revised certain equipment and emission assumptions and staff's data requests are likely to create additional revisions to the operating emissions. Therefore, staff needs the applicant to remodel the operating emissions based on the finalized emission assumptions.

DATA REQUEST

36. Please revise the operations emission modeling, as appropriate, to include all of the revised onsite operating emission estimates.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

Staff is aware of the applicant's desire to acquire existing adjacent/nearby residential properties. Staff's impact analysis needs to consider the nearest residential receptors, so staff needs additional information regarding which residential properties the applicant is trying to acquire and progress regarding that acquisition.

DATA REQUEST

37. Please identify all of the residential properties near/adjacent to the site that the applicant has or is trying to acquire, provide the current status of that acquisition, and provide staff with additional acquisition information as that process moves forward.

RESPONSE

As indicated on pages 2-4 and 2-5 of the Revised AFC, the Project Site and Controlled Area are comprised of what are currently six separate parcels. In addition, the Applicant has entered into an option to acquire another parcel, which is referred to as the "Ackerman Property." Attachment 37-1 contains a map depicting the location of the Ackerman Property and the Memorandum of Option Agreement entered into by the Applicant and the owners of the Ackerman Property, which was recorded with Kern County on May 29, 2009. At this time, the Applicant has not acquired, and is not trying to acquire, any additional parcels near or adjacent to the Project Site.

ATTACHMENT 37-1

BACKGROUND

The fuel type flexibility for this project petroleum coke and coal for hydrogen rich fuel production and natural gas, makes an estimate of operations GHG emissions complex and variable depending on the fuel use assumptions. Staff needs additional information to understand the potential best-case and worst-case conditions for operations GHG emissions.

DATA REQUEST

38. Please indicate if the applicant is willing to formally stipulate to a maximum coal input of 75 percent of the project's gasification feedstock (heat input basis).

RESPONSE

The Applicant is willing to work with the CEC to develop acceptable restrictions on feedstock. It is important for the HECA Project to maintain sufficient fuel diversity and maximize the number of potential fuel suppliers; this is necessary to minimize fuel costs and avoid curtailment caused by short-term disruptions in fuel supply that can occur in the absence of sufficient flexibility. Furthermore, pursuant to its obligations under a Cooperative Agreement between the HECA Project and the U.S. Department of Energy (DOE), the HECA Project must use coal for at least 75 percent of the energy input for the operation of the power plant facilities during the demonstration period, on a fuel input (Btu) basis. Accordingly, the Applicant would be willing to consider a target of 75 percent of the HECA Project's gasification feedstock (heat input basis), provided this is computed on an annual averaging basis and there is sufficient margin to allow the HECA Project to run above the average during the demonstration period to ensure meeting the minimum DOE requirement. The annual basis is necessary both to provide the necessary commercial flexibility and to satisfy federal requirements.

DATA REQUEST

39. Please indicate the minimum required short-term and long-term (annual) coal input.

RESPONSE

During the demonstration period, the HECA Project will use coal for at least 75 percent of the energy input for the operation of the power plant facilities, on a fuel input (Btu) basis, as required by the DOE Cooperative Agreement. The Applicant estimates that this is a minimum of about 800,000 short tons of coal at 85 percent availability. After the demonstration period, the HECA Project will operate with feedstock compositions ranging from 100 percent petcoke to 75 percent coal/25 percent petcoke blends on higher heating value basis. Table 2-11, Representative Heat and Material Balances, in the Revised AFC shows the overall as-received feedstock for the 75 percent coal/25 percent petcoke blend case. As explained in the Revised AFC, it is important for the HECA Project to maintain sufficient fuel diversity and maximize the number of potential fuel suppliers; this is necessary to minimize fuel costs and avoid curtailment caused by short-term disruptions in fuel supply that can occur in the absence of sufficient flexibility.

DATA REQUEST

40. Please indicate if the applicant is willing to formally stipulate to a maximum annual natural gas input to the CTG/HRSG, and if so please provide that input limit.

RESPONSE

The Applicant is unwilling to accept such a limit. The HECA IGCC is a combined-cycle unit that needs to provide reliable base load power supply to the California Integrated System Operator controlled grid. It is important that the HECA Project have the capability to use multiple fuels, including natural gas, to support the necessary process and electrical reliability. As indicated in the response to Data Request 41, the Applicant has assumed a range from 30 percent annual natural gas use for early operations to 10 percent for mature operations.

DATA REQUEST

41. Please provide a range of potential best-case and worst-case GHG operating emissions based on the range of stipulated fuel use limits and other GHG emission source limitations (such as the CO_2 vent). Please note that this estimate should be a line item estimate that includes the balance of operations GHG emissions, including fuel delivery, waste/product hauling, employee trips, etc.

RESPONSE

During mature operation (after approximately the third year of operation, or at 85 percent hydrogen-rich fuel availability), the HECA Project intends to use hydrogen-rich fuel to generate power for the grid. The 10 percent natural gas use scenario represents the Worst Case Scenario for CTG/HRSG mature operation (or at 85 percent hydrogen-rich fuel availability) for estimating the GHG emissions shown in Table 41-1. Please refer to Attachment 41-1 for GHG emissions calculations for normal mature operation. Attachment 41-1 is based on 876 hours per year, correcting an error in the Revised AFC, which incorrectly showed only 50 hours per year of natural gas use in the CTG/HRSG.

During early operations (from the first through the third year of operation, or between 65 percent and 85 percent hydrogen-rich fuel availability), the HECA Project assumes up to 30 percent natural gas use on an annual average basis for the CTG/HRSG operation due to lower gasification block availability during early operations. Higher natural gas use corresponds to lower hydrogen-rich fuel use.

As shown in Table 41-1, in addition to CTG/HRSG operation, the estimated GHG Emissions Scenario comparison also accounts for mature operations (best case) and mature operations (worst case) for CO_2 venting and feedstock transportation. As will be further defined in the response to Data Request 45, mature operations (best case) assumes zero hours of venting and mature operations (worst case) assumes 120 hours (5 days) of CO_2 venting, and early operations assumes the full 504 hours (21 days) of CO_2 venting annually.

Based on emission contributions specified above, total annual GHG emissions from mature operations (best-case) and mature operations (worst-case), and early operations are presented in Table 41-1.

The zero percent natural gas use scenario represents the Best Case Scenario for CTG/HRSG mature operations for estimating the GHG emissions shown in Table 41-1. The 10 percent natural gas scenario represents the case where natural gas is necessary to meet contractual obligations when hydrogen-rich fuel is unavailable.

Table 41-1
Estimated HECA Annual Greenhouse Gas Emissions

	Mature Operations (Best Case)	**Mature Operations (Worst Case)**	**Early Operations**
Natural Gas Operation Scenario, %	0%[1]	10%	30%
Hydrogen-Rich Fuel Operation, hours per year	8,322	7,446	5,694
Intermittent CO_2 Venting, hours per year	0	120	504
Source	**GHG Emissions (tonne/year)**		
CTG/HRSG Natural Gas	0	92,674	278,023
CTG/HRSG Hydrogen-Rich Fuel	257,881	230,735	176,445
CO_2 Vent	0	35,717	150,011
Thermal Oxidizer, Gasifier Warming, other	4,589	29,817	29,817
Total Stationary Source Emissions[2]	**262,469**	**388,943**	**634,296**
Material Transportation Mobile Source Emissions[3]	**13,617**	**12,183**	**9,317**
Estimated Total Annual GHG Emissions	**276,086**	**401,127**	**643,612[4]**

Notes:

1 Please refer to Attachment 41-4 for detailed stationary source GHG emissions calculations for mature operations (best case) or zero natural gas scenario.

2 Please refer to Attachments 41-2 and 41-3 for detailed stationary source GHG emissions calculations for the mature operations (worst case) and early operations, respectively.

3 Mobile source emissions were calculated based on the difference between the current scenario and the project scenario, which includes petcoke transportation, hauling, delivery, and other miscellaneous transportation.

4 Represents the worst case annual emissions during the early operations period.

CO_2 = carbon dioxide
CTG = combustion turbine generator
HRSG = heat recovery steam generator

ATTACHMENT 41-1

ATTACHMENT 41-2

ATTACHMENT 41-3

BACKGROUND

This project will use petroleum coke from sources that are currently providing this fuel/raw material source to other users. Staff needs to understand how this facility may impact the operations of those facilities, including the potential for additional fuel transportation caused by this project.

DATA REQUEST

42. Please indicate if the applicant has obtained rights to the specified sources of petroleum coke and if that will restrict the operation of other power generation facilities in California, or require them to obtain fuel from other more distant sources.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

BACKGROUND

GHG estimates are necessary for all phases of the project in order to complete the GHG analysis for the project.

DATA REQUEST

43. Please provide GHG emission estimates for the entire construction period. This estimate should include all GHG emission sources, including offsite truck trips, construction employee trips, etc.

RESPONSE

GHG emissions from all construction-related activities are presented in Appendix D1.1 of the Revised AFC in the first two tables, entitled “Total Short-Term Construction Emissions,” and “Total Annual Construction Emissions.”

BACKGROUND

The AFC notes that the CO_2 vent may operate up to 504 hours per year. However, staff is not certain how this number is derived or whether the applicant has guarantees in place for the carbon sequestration. Additionally, staff is uncertain how much of the injected CO_2 would stay sequestered permanently and how much may be emitted with the extracted petroleum. Staff needs additional information about the carbon sequestration and the CO_2 vent operation to complete the criteria pollutant and GHG emissions analysis for the project.

DATA REQUEST

44. Please provide information regarding guarantees from the location(s) that will be used for sequestration that provides assurance that the CO_2 vent will not need to operate for more than 504 hours per year.

RESPONSE

The assurance that a geologic reservoir is an appropriate site for sequestration of CO_2 is based on its physical characteristics and appropriate and prudent operations. The physical characteristics of the Elk Hills Field have been thoroughly discussed in the Revised AFC, and demonstrate that it is a premium site for CO_2 sequestration, with more than adequate capacity to sequester the CO_2 captured by the HECA Project. With respect to prudent operations, Occidental of Elk Hills, Inc. (OEHI) is a premier CO_2 enhanced oil recovery (EOR) operator and will be submitting an Injection Permit to the Division of Oil, Gas and Geothermal Resources Region 4 office in Bakersfield. In addition to its prudent, world-renowned operations, OEHI will conduct its operations in compliance with its permit and regulatory requirements. Furthermore, as explained in response to Data Request 46, the 504 hours per year of venting does not represent normal mature operations, but rather potential CO_2 venting during early operations. Please see response to Data Request 46.

DATA REQUEST

45. Please identify how the value of 504 hours for maximum CO_2 venting was determined.

RESPONSE

The 504 hours were based on the following types of events that require venting CO_2 and could occur over any 1-year period. These events include: (A) Gasification Block cold startups; (B) unplanned outages of the CO_2 compressor; (C) unplanned outages of the CO_2 pipeline; and (D) CO_2 Off-Taker Unable to Accept. The scenarios shown in Table 45-1 were developed as a conservative estimate of the venting that may be required during the early operation and for mature operation:

Table 45-1
Carbon Dioxide Venting Scenarios

Scenario for Early Operation				
	Event	**Events per Year**	**Duration or Time to Repair (Days per Event)**	**Days per Year of CO_2 Vent Operation (1)**
A	Cold Gasification Block Startup	6	1	6
B	CO_2 Compressor Unplanned Outage	4	2	8
C	CO_2 Pipeline Unplanned Outage	1	1	1
D	CO_2 Off-Taker Unable to Accept	2	3	6
Total Days				21
Scenario for Mature Operation				
	Event	**Events per Year**	**Duration or Time to Repair (Days per Event)**	**Days per Year of CO_2 Vent Operation (1)**
A	Cold Gasification Block Startup	1	1	1
B	CO_2 Compressor Unplanned Outage	2 to 4	2	4 to 8
C	CO_2 Pipeline Unplanned Outage	0 to 1	1	0 to 1
D	CO_2 Off-Taker Unable to Accept	0	0	0
Total Days				5 to 10

Note:

1 The flow rate of CO_2 during venting will vary depending on the number of gasifiers operating and the syngas/hydrogen-rich fuel production rate. Venting during a cold Gasification Block startup is expected to be less than one-half on the maximum CO_2 production.

Comparing the daily CO_2 emissions associated with venting (6,000 to 9,000 tons per day) with the CO_2 emitted during a 12-day outage (36,000 to 44,000 tons) indicates that venting for between 4 and 7 days yields about the same CO_2 emissions as shutting down the Gasification Block. Safe operation of the HECA Project is a key factor in considering the above options. Shutting down the entire Gasification Block and restarting it increases the risk of upsets and must be considered when evaluating whether to vent CO_2 or shut down the Gasification Block.

Please refer to the response to Data Request 12 for additional discussion regarding the need to vent CO_2 and approaches to minimizing annual CO_2 emissions.

DATA REQUEST

46. Please identify if the applicant is willing to stipulate to a condition limiting the CO_2 vent operation to no more than 504 hours per year, or some proportion of the regular operating hours where CO_2 is sequestered.

RESPONSE

As discussed in response to Data Request 41, during early operations (from the first through the third year of operation, when availability is expected to improve from 65 percent to 85 percent), the worst case of CO_2 venting is assumed—504 hours (21 days). However, during mature operations (after early operations, or at 85 percent hydrogen-rich fuel availability), the HECA Project expects that it will require approximately 120 hours (5 days) of CO_2 venting. Due to the need for operational and commercial flexibility, the Applicant is unable to agree to a condition limiting the number of hours that the CO_2 vent may be used annually. The Applicant is willing to work with the CEC on the circumstances and conditions under which the CO_2 vent is used for the HECA Project.

Please refer to the HECA Project's response to Data Requests 12, 41, and 45, for additional discussion regarding the need to vent CO_2, and approaches to minimizing annual CO_2 emissions.

DATA REQUEST

47. Please identify the CO_2 concentration in the CO_2 vent gas that was used in the GHG emissions calculation.

RESPONSE

The composition of the CO_2 vent stream is anticipated to be almost entirely CO_2 gas, with only trace amounts (no more than 0.1 percent) of carbon monoxide (CO) and reduced sulfur compounds. As presented in Table 5.1-33 (DEGADIS Model Inputs and Parameters) of the Revised AFC, the estimated concentration of CO is 1,000 ppm, or 0.1 percent. The estimated concentration of hydrogen sulfide (H_2S) is 10 ppm (0.001 percent).

DATA REQUEST

48. Please provide an estimate of the additional petroleum production that will be enabled by the project's CO_2 sequestration.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

49. Please describe the life-cycle for the injected CO_2, in particular any steps that will be taken at the petroleum production sites to recover and re-inject the HECA injected CO_2 that would accompany the extracted crude petroleum products and what guarantees that these recovery and reinjection actions will occur throughout the life of the HECA project.

RESPONSE

Specific information related to produced-CO_2 recovery and reinjection processes associated with oil recovery will be detailed in the OEHI EOR and Sequestration Project's CO_2 Injection Permit, which will be submitted to the Division of Oil, Gas, and Geothermal Resources Region 4 office in Bakersfield.

A typical EOR operation using CO_2 would involve the following steps:

1. Captured or naturally produced CO_2 is compressed and transported to injection wells, which are located to optimize oil recovery from the reservoir.
2. The injected CO_2 moves through pore spaces within the rock, contacting and mixing with the residual oil.
3. The resulting miscible fluid is swept towards producing wells, also located to optimize oil recovery from the reservoir.
4. The produced fluids (oil, water, hydrocarbon gas and CO_2) from individual wells are collected and transported via a closed piping system, specially designed to accommodate a wide range of potential fluids and pressures.
5. The produced fluids from a number of wells are consolidated at a central location where the produced fluids are separated: oil, water, and gas.
6. The oil is sent to a tank battery or pipeline for sale, the water is treated and typically re-injected, and the gas, which contains hydrocarbon gas and any produced CO_2, is sent to the gas separation facility for further processing via a closed piping system.
7. At the gas separation facility, certain products, such as sulfur, may be removed, and the hydrocarbon gas and CO_2 are separated.
8. The processed hydrocarbon gas is sent via pipeline for sale and the CO_2 is recompressed and transported back via closed piping system to injection wells where it is reinjected for additional EOR and sequestration.

This entire process occurs within a specially designed, closed system. During the entire process, there is no venting of CO_2 to the atmosphere. CO_2 is a valuable commodity; as such, there is significant financial incentive for EOR operators to closely monitor and contain all CO_2.

DATA REQUEST

50. Please estimate the amount of injected CO_2 that will be emitted, with consideration of any guaranteed recovery and reinjection processes, with the extracted crude petroleum products.

RESPONSE

Specific information related to CO_2 recovery and reinjection processes associated with oil recovery will be detailed in the OEHI EOR and Sequestration Project's CO_2 Injection Permit, which will be submitted to the Division of Oil, Gas, and Geothermal Resources Region 4 office in Bakersfield.

During normal operations, there is no venting or emission of CO_2 to the atmosphere. CO_2 is a valuable commodity, and there is significant financial incentive for EOR operators to closely monitor and contain all of the injected CO_2, as described in the section of Appendix F of the Revised AFC titled *Overview of CO_2 EOR and Sequestration*.

The entire EOR process occurs within a specially-designed, closed system. During normal operations, there is no venting or emission of CO_2 to the atmosphere. CO_2 is a valuable commodity, and there is significant financial incentive for EOR operators to closely monitor and contain all of the injected CO_2, as described in the section of Appendix F of the Revised AFC titled *Overview of CO_2 EOR and Sequestration*.

The DOE's National Energy Technology Laboratory recently released a report titled *Carbon Dioxide Enhanced Oil Recovery* (DOE-NETL, 2009), in which the DOE specifically addressed the question, "Won't the carbon dioxide be released when the oil is produced?" DOE's answer is found on page 23: "*No. Any CO_2 that is produced along with oil and natural gas is captured and re-injected. The company operating the EOR project bought the CO_2 and expects to re-inject it if any is produced, to maximize its value. It only has value when it is used to remove oil from the rock formation underground, so there is a strong economic motivation to collect it for re-injection, either in the current project or another. When a CO_2 EOR flood is finished, the CO_2 that remains underground stays there. Monitoring efforts can be put into place to make sure that is true.*"

Reference

DOE-NETL (Department of Energy-National Energy Technology Laboratory), 2009. Carbon Dioxide Enhanced Oil Recovery – Untapped Domestic Energy Supply and Long Term Carbon Storage Solution. DOE/NETL Oil and Natural Gas Technologies, Exploration, and Production Report – CO_2 EOR Primer. 32 pp. www.netl.doe.gov. September.

BACKGROUND

A Determination of Compliance (DOC) analysis from the SJVAPCD will be needed for staff's analysis. Staff will need to coordinate with the applicant and SJVAPCD to keep apprised of any air quality issues determined by the District during their permit review.

DATA REQUEST

51. Please provide copies of any official submittals and correspondence to or from the SJVAPCD within 5 days of their submittal to or their receipt from the SJVAPCD.

RESPONSE

The Applicant began providing the CEC with copies of official San Joaquin Valley Air Pollution Control District (SJVAPCD) submittals and correspondence upon the receipt of this Data Request. The Applicant will continue to provide official correspondence to the CEC as it is exchanged with SJVAPCD.

BACKGROUND

In order to coordinate with U.S. Environmental Protection Agency (EPA) during the licensing process staff needs the name and contact information of the assigned U.S. EPA Prevention of Significant Determination (PSD) permit engineer. Additionally, staff needs an update on the PSD permit applicant status and needs to be copied on substantive communication with U.S. EPA.

DATA REQUEST

52. Please provide the name and contact information for the assigned U.S. EPA PSD permit engineer.

RESPONSE

The lead contact at U.S. EPA Region IX evaluating the HECA PSD application is:

Ms. Shirley F. Rivera
Environmental Engineer
Air Division, Air Permits Office
U.S. EPA Region IX
75 Hawthorne Street (Air-3)
San Francisco, CA 94105
Phone: (415) 972-3966
Fax: (415) 947-3579
Email: rivera.shirley@epa.gov

DATA REQUEST

53. Please provide the current status of the PSD permit application review.

RESPONSE

The U.S. EPA confirmed the receipt of the PSD application amendment on October 8, 2009. U.S. EPA staff is processing the application.

DATA REQUEST

54. Please provide copies of any official submittals and correspondence to or from the U.S. EPA within 5 days of their submittal to or their receipt from the U.S. EPA.

RESPONSE

The Applicant began providing the CEC with copies of official U.S. EPA submittals and correspondence upon the receipt of this data request. The Applicant will continue to provide official correspondence to the CEC as it is exchanged with the U.S. EPA.

DATA REQUEST

55. Please provide, when available, the Federal Lands Manager's (FLM) official acceptance of the PSD Class 1 modeling analysis.

RESPONSE

The Federal Lands Manager's acceptance of the Class I modeling will be forwarded to the CEC when it is received.

BACKGROUND

The project will require approval from the U.S. Department of Energy (DOE), which would appear to trigger General Conformity regulations. Staff needs additional information regarding the appropriate DOE air quality professional contact(s) and the applicant's proposal to show a positive General Conformity finding.

DATA REQUEST

56. Please identify the appropriate DOE air quality contact for this project, and provide their e-mail and phone number.

RESPONSE

The appropriate contact at the DOE for air quality is:

Mr. R. Paul Detwiler
Email: Ralph.detwiler@netl.doe.gov
(412) 386-4839 Office
(412) 651-2201 Mobile

DATA REQUEST

57. Please provide a comparison of the San Joaquin Valley Air Basin (SJVAB) total construction emissions and operating emissions (after addressing all other air quality data requests that may impact those emission estimates) versus the General Conformity applicability requirements. Please note that the applicability requirements should reflect both the current nonattainment status and any anticipated changes to the nonattainment status that are scheduled or likely to occur prior to the DOE Record of Decision.

RESPONSE

Operational emissions from stationary sources are presumed to conform to the Clean Air Act and the State Implementation Plan because they are subject to PSD/New Source Review (NSR) requirements and permitting (40 Code of Federal Regulations [CFR] 93.153[d][1]; 40 CFR 51.853[d][1]). Total construction emissions and mobile source emissions during operation within the SJVAB are compared to the General Conformity Rule (GCR) de minimis thresholds in Table 57-1. Two construction periods were considered: the 12-month period spanning Months 1 through 12 when the majority of earthmoving would take place, and the 12-month period spanning Months 17 through 28, when the maximum amount of construction equipment would be on site.

As shown in bold font in Table 57-1, during the construction period, only NO_x emissions would exceed the de minimis threshold of 10 tons per year for an extreme ozone non-attainment area, making GCR applicable to the project emissions during construction. None of the mobile source emissions during operation would exceed the de minimis thresholds.

On April 30, 2007 the Governing Board of the SJVAPCD voted to request that the U.S. EPA reclassify the SJVAB as extreme non-attainment for the federal 8-hour ozone standards. On June 14, 2007, CARB approved this request. This request was forwarded to the U.S. EPA by CARB on November 16, 2007, and U.S. EPA proposed to grant the request on August 27, 2009. The comment period on the U.S. EPA proposal closed on September 28, 2009, and U.S. EPA is in the process of responding to comments. For the purposes of this data response, the area will be treated as an extreme ozone non-attainment area, due to the anticipated U.S. EPA rulemaking that could take place before the DOE Record of Decision.

The SJVAB is a maintenance area for the federal PM_{10} standard. Construction period PM_{10} emissions and operational mobile PM_{10} emissions would not exceed the GCR de minimis level of 100 tons per year for PM_{10}.

Supporting files showing emission factors and inputs are included as Attachment 57-1.

Table 57-1
Summary of Construction Emissions and Mobile Source Emissions During Operation Within the San Joaquin Valley Air Basin

Construction Emissions	**CO (tons/year)**	**NO_X (tons/year)**	**PM_{10} (tons/year)**	**ROG (tons/year)**
Months 1 – 12				
Onsite Fugitive Dust			14.74	
Offsite Exhaust	2.95	4.91	0.37	1.06
Offsite Fugitive Dust			0.14	
Total	2.95	4.91	15.25	1.06
GCR De Minimis Levels	N/A – Attainment	10	100	10
Months 17 – 28				
Onsite Exhaust	17.75	39.25	2.19	5.47
Onsite Fugitive Dust			0.14	
Total	17.75	**39.25**	2.33	5.47
GCR De Minimis Levels	N/A – Attainment	10	100	10
Mobile Source Emissions During Operation Within the SJVAB	**CO (tons/year)**	**NO_X (tons/year)**	**PM_{10} (tons/year)**	**ROG (tons/year)**
Truck and Rail (Net Increase)	3.69	6.54	0.37	0.76
GCR De Minimis Levels	N/A – Attainment	10	100	10

Notes:

1 GCR NO_X and ROG de minimis levels are for extreme ozone non-attainment area.

2 GCR PM_{10} de minimis level is for PM_{10} moderate non-attainment or maintenance area.

3 Bold values indicate emissions are above GCR de minimis level.

4 Truck net increase emissions are from Table 5.1-26 in the Revised AFC and represent the difference in mobile source emissions in the SJVAB between the Project Scenario and the current transportation practice.

ATTACHMENT 57-1

DATA REQUEST

58. Please provide a proposed methodology for the General Conformity determination (offsets, etc.) for the pollutants found to exceed the General Conformity applicability thresholds for construction and operation.

RESPONSE

Operational emissions from plant stationary sources are presumed to conform with the Clean Air Act and State Implementation Plan because they are subject to PSD/NSR requirements and permitting (40 CFR 93.153[d][1]; 40 CFR 51.853[d][1]). Response to Data Request 57 shows that indirect, offsite mobile source emissions would not exceed GCR de minimis levels, but total construction emissions would exceed the GCR de minimis thresholds for NO_x, so the GCR would apply to construction emissions. To satisfy NSR permitting requirements related to NO_x emissions, the Applicant will be required to provide offsets in excess of the amount shown in the summary table in response to Data Request 57 (39.25 tons per year) prior to the start of construction. This would reduce the net increase in NO_x emissions during construction to zero.

Technical Area: Biological Resources
Author: Brian McCollough

BACKGROUND

The project would involve pipeline routes crossing the Kern River and the Kern River Flood Control Channel, and passing through the Coles Levee Ecosystem Preserve. Staff contacted Julie Vance of the California Department of Fish and Game (CDFG) to discuss the proposed project. Ms. Vance recommended that Streambed Alteration Notification Packages be prepared for the Kern River and Kern River Flood Control Channel crossings, and submitted to the CDFG. The information submitted in the Streambed Alteration Notification Packages will be used to determine if Streambed Alteration Agreements would be necessary, but for the Energy Commission's exclusive jurisdiction, and then to develop the resource protection measures that will be included in staff's analysis and proposed conditions of certification.

Ms. Vance also expressed concern regarding the pipeline route passing through the Coles Levee Ecosystem Preserve. CDFG holds a conservation easement on this property, and the proposed pipeline route would conflict with the conservation easement.

DATA REQUEST

59. Please consult with CDFG regarding the preparation of full and complete Streambed Alteration Notification Packages. Please also provide a report of conversation regarding any guidance provided by CDFG as to how to prepare complete Streambed Alteration Notification Packages. Please submit the completed packages to CDFG and provide a copy to Energy Commission staff.

RESPONSE

The Applicant is currently preparing a Lake and Streambed Alteration Agreement (LSAA) Notification Package, following the California Department of Fish and Game (CDFG) guidelines, and will consult with CDFG for preparation of an LSAA. The LSAA Notification Package will be submitted to CDFG in spring 2010. A copy will also be submitted to the CEC.

DATA REQUEST

60. Please consult with CDFG and the U.S. Fish and Wildlife Service (USFWS) regarding the pipeline route through the Coles Levee Ecosystem Preserve. As the linear routes have not yet been finalized, please consider design changes, including re-routing any linear project features around this sensitive area, such that the conditions of the conservation easement on that property are not violated. Please provide records of conversation regarding discussions with the wildlife agencies about protective measures, including the possibility of re-routing linear features that would result in compliance with the conservation easement for the Coles Levee Ecosystem Preserve.

RESPONSE

The Applicant will and has consulted with CDFG and the USFWS regarding the pipeline route through the Coles Levee Ecosystem Preserve. The Applicant, CDFG, and USFWS met at Coles Levee on June 1, 2009 to discuss the proposed natural gas/potable water pipeline alignment from State Route 119 to the Project Site. The primary discussion point for the site visit was the proposed alignment within the Coles Levee Ecological Preserve. Alternate routes were discussed, but no preferred routes were identified.

CDFG offered to take the lead in reviewing the Coles Levee conservation easement language to see if the proposed alignments would violate the conditions of the conservation easement.

Since the June 1, 2009 meeting, the Applicant has followed up with CDFG about its opinion on the conservation easement. After receiving these data requests, the Applicant sent a request for information to CDFG, as requested by CEC. The Applicant is awaiting CDFG's analysis.

BACKGROUND

The proposed project site and off-site linear routes provide potential habitat for several federal or state listed species. Staff will need to incorporate into its analysis the protective measures that would be included in federal and state incidental take permits. As a result of the Energy Commission's exclusive jurisdiction regarding siting power plants, CDFG will not be issuing permits, but the requirements that would have been in the CDFG permits will be incorporated into the Energy Commission license. The applicant needs to apply to CDFG and USFWS for the appropriate take permits. The applicant proposes obtaining the federal take permit through an Endangered Species Act Section 7 consultation initiated by the U.S. Environmental Protection Agency (EPA). The application for the state Incidental Take Permit (ITP) should include appropriate mitigation measures, including a suggested habitat compensation strategy, such that impacts to state endangered species are fully mitigated. Staff needs the take permit applications to be completed and submitted to the wildlife agencies so that the wildlife agencies can develop the appropriate listed species protective measures, provide them to the applicant, and staff can then incorporate these measures into its analysis and conditions of certification.

DATA REQUEST

61. Please provide a status update on the anticipated schedule for the EPA's initiation of the Section 7 consultation process with USFWS and the preparation of the Biological Assessment and Biological Opinion.

RESPONSE

The DOE and the Applicant recently entered a Cooperative Agreement effective September 30, 2009. Under this agreement, the DOE has awarded up to $308 million in government sharing of HECA Project costs.

Based on the receipt of DOE federal funding, the DOE will be the federal nexus for formal consultation with the USFWS under Section 7 of the federal Endangered Species Act. URS is scheduled to provide DOE with the necessary information to prepare a Biological Assessment in January 2010. Under this schedule, DOE is projected to submit a Biological Assessment to the USFWS in February or March 2010. It is anticipated that the USFWS will require a minimum of 3 to 6 months to finalize the Biological Opinion after reviewing the Biological Assessment.

DATA REQUEST

62. Please provide a schedule for the preparation and submittal of the state Incidental Take Permit application.

RESPONSE

An Incidental Take Permit (ITP) is currently being prepared and is expected to be submitted to the CDFG by March 2010.

DATA REQUEST

63. Please prepare and submit the ITP application to CDFG, and provide a copy of the completed state ITP application to staff.

RESPONSE

It is anticipated that the ITP application will be submitted to the CDFG in March 2010. A copy will be provided to the CEC upon submittal to the CDFG.

Technical Area: Cultural Resources
Authors: Amanda Blosser, Beverly E. Bastian, and Michael McGuirt

Note: Any information that identifies the location of archaeological sites needs to be submitted under confidential cover.

BACKGROUND

The Hydrogen Energy California (HECA) Project anticipates a variety of ground-disturbing activities that have the potential to impact previously known and newly identified archaeological sites within and adjacent to the project Rights-of-Way (ROWs). The project ROWs are defined by the project as:

- The project site and laydown areas, plus 50 feet around them;
- A transmission line corridor 175 feet wide; and
- In or within 50 feet of the centerline of all other proposed linear facilities, such as pipelines.

In addition to ground disturbance in these ROWs, the HECA project would construct both temporary and permanent access roads, use horizontal directional drilling (HDD) under extant linear facilities, and install tubular transmission line support structures. To identify all potential project impacts to cultural resources, staff needs additional location data on various project components, on the extent of cultural resources survey completed and remaining to be completed, and on all known and newly identified cultural resources.

DATA REQUEST

64. Please provide, under confidential cover, a series of maps (based on USGS 7.5-minute topographic maps enlarged to a scale of 1"=1,000 feet) that includes the project site and all the proposed alternative routes of linear facilities. In addition to the project components, please depict the following:

A. The boundaries of all project ROWs;

B. All areas surveyed for cultural resources;

C. All areas that are within the archaeological survey area required in the Energy Commission's siting regulations (in or within 200 feet of the project site, and in or within 50 feet of the centerline of all linear facilities) that were not surveyed by pedestrian archaeological survey related to this project, including the south-southwest side of the West Side Canal;

D. All cultural resources that have been identified in or within 200 feet of the project ROWs. Please label the cultural resources with identifying site or isolate numbers;

E. The proposed locations of pipeline laydown areas and HDD pits;

F. The proposed installation locations of transmission line tubular support structures;

G. The proposed locations of both temporary and permanent access roads that the project would construct;

H. The proposed location of the carbon dioxide pipeline custody transfer point; and

I. The proposed locations of the five groundwater extraction wells that would provide process water for the HECA Project.

RESPONSE

Figure 64-1 has been provided under confidential cover, at the requested scale, on U.S. Geological Survey maps. The project components and identified cultural resources have been included on the maps, along with areas that have not been surveyed for cultural resources that are within the CEC's defined archaeological survey area for linear facilities. All required areas and buffer radii have been surveyed, unless otherwise noted on Figure 64-1.

A. The boundaries of the HECA Project ROWs have been included on Figure 64-1.

Transmission Line

The transmission route alternatives 1 and 2 have been modified (shown as transmission routes 1A and 1B).

Process Water Line

As required by CEC regulations, the archaeological surveys for the HECA Project included a 50-foot-wide buffer radius around the ROWs for each of the various linear alternatives. As stated in the Revised AFC, the exception was along the process water line ROW. The process water line is to be placed adjacent to the north-northeastern side of the West Side Canal, and construction would not occur on the south-southwestern side of the canal. All access during construction would occur from the north-northeastern side of the canal. Construction vehicles would be limited to the 50-foot construction ROW along the 15-mile pipeline route. Therefore, the Applicant did not require or secure access to any property that lies on the opposite (south-southwest) side of West Side Canal from the process water line ROW. Because the West Side Canal would act as a physical barrier for construction and access, impacts to archaeological deposits situated across the canal from the construction area would not occur, and therefore, the area south-southwest of the canal does not require archaeological survey efforts.

CO_2 Line

The Applicant has identified a preferred CO_2 pipeline alignment, as shown on Figures 64-1 and 68-1. This alignment was selected because the majority of the alignment is located along existing access roads. This alignment is a combination of the CO_2 pipeline alignments analyzed in the Revised AFC.

B. All areas of the HECA Project have been surveyed unless otherwise indicated on Figure 64-1.

C. All areas that have not been surveyed that are within the CEC's defined archaeological survey area for linear facilities are shown on Figure 64-1.

D. All cultural resources identified in or within 200 feet have been included on Figure 64-1.

E. Pipeline laydown areas and HDD pits would be within the construction ROWs, as shown on Figure 64-1.

F. As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

G. All new temporary access roads would be located within the construction ROWs, as shown on Figure 64-1. Any new permanent access roads would be located on the Project Site and within the permanent ROWs, as shown on Figure 64-1. As noted in Table 2-1 of the Revised AFC, the transmission linear would require a 25-foot-wide temporary road.

H. The proposed custody transfer point for the CO_2 line is shown on Sheet 13 of Figure 64-1.

I. The proposed locations of the five groundwater extraction wells have not been finalized. However, all of the wells are expected to be located along the western edge of the proposed well field along the permanent ROW to avoid the need for access roads and connecting pipelines, as shown on Sheets 1 and 2 of Figure 64-1.

BACKGROUND

Staff's review of the Cultural Resources section of the Application for Certification (AFC) and the Archaeological Resources Report indicated that some areas that the Energy Commission Regulations require to be surveyed for cultural resources were not surveyed due to access or other limitations. To complete its inventory of cultural resources that may be subject to project impacts, staff needs these areas to be surveyed and to receive a report of the survey results.

DATA REQUEST

65. Please survey for cultural resources those areas mapped under the previous Data Request, part c, as not surveyed by pedestrian archaeological survey related to this project.

RESPONSE

A pedestrian archaeological survey will be undertaken for the areas not previously surveyed, as depicted on the series of maps included with response to Data Request 64. As noted in response to Data Request 64, the transmission route alternatives 1 and 2 have been modified, and this modified transmission route (1A and 1B) will be surveyed.

As required by the CEC regulations, the archaeological surveys for the HECA Project included a 50-foot-wide buffer radius around the ROW for each of the various linear alternatives. As stated in the Revised AFC, the exception was along the process water line ROW. The process water line is to be placed adjacent to the north-northeastern side of the West Side Canal. Construction would not occur on the south-southwestern side of the Canal, nor would any access be provided from the south-southwestern side. As such, access was not needed to any property on the opposite side of West Side Canal from the process water line ROW. Because the West Side Canal would act as a physical barrier for construction, impacts to archaeological deposits situated across the canal from the construction area would not occur, therefore, the area south-southwest of the canal does not require archaeological surveys.

DATA REQUEST

66. Please provide a date or dates when reports for the additional survey will be provided to staff.

RESPONSE

The addendum reports for the additional surveys are anticipated to be provided in January 2010.

BACKGROUND

Although the proposed depth or width of disturbance was provided for some components of the project, comprehensive information was not provided for the proposed project site location, all the proposed linear facilities, and HDD pit locations. To assess the project's potential to impact buried cultural resources, staff needs to know the extent of the ground disturbance associated with the construction of these project components.

DATA REQUEST

67. Please provide a table showing the maximum depth of disturbance for the proposed project site; the length, width, and depth of the HDD pit locations and of both the temporary and permanent access roads; and the maximum trench depth and width for the process water line route, the transmission line alternative routes, the combination potable water and natural gas pipelines route, and the carbon dioxide pipeline alternative routes.

RESPONSE

None of the pipelines have undergone preliminary or detailed engineering; therefore, the construction plan is not complete at this time. As stated in Section 2.6.1.10 of the Revised AFC, the maximum depth for the linears at proposed HDD crossings is 100 feet. The detailed information requested for the Project Site, HDD pits, temporary and permanent access roads, and linears is anticipated to become available by December 2010. Generally, the tops of all subsurface linear pipelines will be 5 feet below grade, except for HDD crossings. The pipeline trench depth will extend approximately 1 foot below the bottom of the pipeline. For example, the bottom of the trench for a 16-inch-diameter natural gas pipeline will be 5 feet plus 16 inches plus 1 foot, or a total of 7 feet and 4 inches below grade.

BACKGROUND

The confidential cultural resources technical report identified twenty-four archaeological sites that could be impacted by the construction activities of the proposed HECA project and that staff believes could hold archaeological deposits potentially eligible for the California Register of Historical Resources (CRHR). One site, P-15-3079, which now includes site P-15-6073, has been determined eligible for the National Register of Historic Places (NRHP), and project impacts to it would require mitigation. In addition, site P-15-6087 was previously recommended NRHP-eligible, and the cultural resources consultant for the Applicant concurs with that recommendation. Sites P-15-171 (described as a burial mound) and P-15-126 were not relocated during the pedestrian survey. In addition, the cultural resources consultants to the Applicant have listed other previously recorded and newly identified archaeological sites situated within the project ROWs that may be impacted by the proposed project. At present, staff does not have enough information regarding these sites to determine whether they could be CRHR-eligible on the grounds that they could yield information important in prehistory. Consequently, staff believes that either these sites should be avoided or they should be tested to enable staff to better evaluate their potential to yield important data.

DATA REQUEST

68. Please provide a plan to avoid project impacts to the following previously recorded or newly identified archaeological sites: P-15-125, P-15-666, P-15-2422, P-15-3077, P-15-3167, P-15-3254, P-15-6736, P-15-6767, P-15-6768, P-15-6769, P-15-9737, P-15-9738, HECA-1008-1, HECA-2009-1, HECA-2009-2, HECA-2009-3, HECA-2009-4, HECA-2009-5, HECA-2009-6, and HECA-2009-7.

RESPONSE

The Applicant has identified a preferred CO_2 pipeline alignment, as shown on Figure 68-1. This alignment was selected because the majority of it follows existing access roads. This alignment is a combination of the CO_2 pipeline alignments analyzed in the Revised AFC. The preferred CO_2 alignment would not impact the following identified archaeological sites: P-15-3077, P-15-3167, P-15-6768, P-15-6769, and P-15-6780. This pipeline alignment and all other project linears identified in the Revised AFC and in the response to Data Request 64 (Figure 64-1) will continue to undergo refinements to avoid impacts to identified archaeological sites. The HECA Project's goal is to avoid all archaeological sites. Measures that are being explored to avoid archaeological sites include:

- Refine the route and locate temporary construction work areas to avoid archaeological sites.
- Reduce the width of temporary construction work areas to minimize surface disturbance near archaeological sites.
- Use construction techniques that eliminate adverse impact on archaeological sites.

Figure 68-1 (front)

Figure 68-1 (back)

DATA REQUESTS

69. If impacts to the sites listed in this data request cannot be avoided, please submit for staff approval a plan, including a research design, for using test excavations to determine if any subsurface deposits are present and to acquire sufficient data to make recommendations of CRHR eligibility for these sites, with the potential of the recovered data evaluated according to its applicability to the research questions posed in the research design.

70. Please provide to staff a letter report on the testing and results at these sites, presenting an analysis of the recovered data and recommendations regarding the eligibility of the sites.

RESPONSE TO DATA REQUESTS 69 AND 70

The Applicant intends to avoid impacts to archaeological sites associated with Project linears identified in the Revised AFC and in the response to Data Request 64. For archeological sites that cannot be avoided, the Applicant will commit, as a Condition of Certification, to preparing a plan, including a research design, for using test excavations to determine California Register of Historical Resources (CRHR) eligibility and, if required, data recovery as mitigation. Similarly, the Applicant will commit, as a Condition of Certification, to providing the staff with a letter report summarizing the testing and results at such sites, with an analysis of the recovered data and recommendations regarding the eligibility of the sites.

BACKGROUND

The confidential Archaeological Resources Report, submitted for the HECA Project, included a map, Figure 1, which detailed the location of archaeological sites near the proposed project site and linear facilities. Since the boundaries of many of the sites are not well determined, and the locations of proposed access roads have not been provided by the Applicant, it appears that some sites might extend into areas where they could be impacted by project construction. The additional sites that appear close to project facilities and subject to impact from the project are P-15-89, P-15-179, P-15-173, P-15-2485, P-15-124, P-15-6782, P-15-6766, and P-15-3087. To identify all potential project impacts to cultural resources, staff needs additional location data on these sites.

DATA REQUEST

71. If the boundaries of sites P-15-89, P-15-179, P-15-173, P-15-2485, P-15-124, P-15-6782, P-15-6766, and P-15-3087 appear to be within 200 feet of any of the project ROWs, please provide a discussion of the potential for impacts to the site by the proposed project.

RESPONSE

P-15-89

As indicated in Section 5.3-28 of the Revised AFC, the process water line is to be placed adjacent to the north-northeastern side of the West Side Canal, and construction would not occur on the south-southwestern side of the Canal. Because the Canal would act as a physical barrier for construction, impacts to archaeological deposits situated across the Canal from the construction area would not occur; therefore, the area south-southwest of the canal was not surveyed. The location of the previously recorded archaeological site, P-15-89, clearly depicts the site on the south-southwestern side of the Canal. Due to the location of the site and the negative findings of the pedestrian archaeological reconnaissance of the process water line construction ROW in the vicinity of P-15-89, there is no indication that the site will be impacted by the HECA Project.

P-15-124

No evidence of P-15-124 was encountered during the archaeological pedestrian reconnaissance of the proposed natural gas/potable water line. Based upon map measurements, P-15-124 is approximately 400 feet west of the natural gas/potable water line construction ROW. No impacts to P-15-124 are anticipated as a result of the HECA Project.

P-15-173

P-15-173 is located west of the Transmission Line Alternative 1 that was presented in the Revised AFC. This transmission line alternative has been modified (shown as modified transmission routes 1A and 1B on Figure 64-1, which was submitted separately under confidential cover as part of the response to Data Request 64). The modified transmission routes 1A and 1B are not within 200 feet of P-15-173. No impacts to P-15-173 are anticipated as a result of the HECA Project.

Additional information regarding resources along modified transmission routes 1A and 1B will be forthcoming pending additional archaeological pedestrian reconnaissance of the routes. See responses to Data Requests 64 (submitted separately under confidential cover), 65, and 66.

P-15-179

No evidence of the previously recorded archaeological site, P-15-179, was encountered during the pedestrian archaeological reconnaissance of the process water line. As plotted, the site is situated outside of the surveyed corridor, which consists of the process water line construction ROW and a 50-foot-wide buffer radius. The Archaeological Site Survey Record for P-15-179, obtained from the Southern San Joaquin Valley Information Center as part of the record search for the project, does not contain a detailed sketch map (Pilling 1950). According to the Archaeological Site Survey Record, the plotting of the site is based on an earlier version of the East Elk Hills 7.5-minute USGS quadrangle, which depicted a “Burial Mound” in the location of P-15-179. No description of the site’s dimensions, artifacts, or the presence of human remains is provided. Although the site is located within 200 feet of the process water line construction ROW, the findings were negative during the pedestrian archaeological reconnaissance of the process water line construction ROW in the vicinity of P-15-179. As a result, there are no anticipated impacts to the site as a result of the HECA Project.

P-15-2485

P-15-2485 is located southwest of the Transmission Line Alternative 1 that was presented in the Revised AFC. This transmission line alternative has been modified (shown as modified transmission routes 1A and 1B on Figure 64-1). The modified transmission routes 1A and 1B are not within 200 feet of P-15-2485. No impacts to P-15-2485 are anticipated as a result of the HECA Project.

Additional information regarding resources along modified transmission routes 1A and 1B will be forthcoming pending additional archaeological pedestrian reconnaissance of the routes. See responses to Data Requests 64 (submitted separately under confidential cover), 65, and 66.

P-15-3087, P-15-6766, and P-15-6782

P-15-3087, P-15-6766, and P-15-6782 are located within 200 feet of CO_2 alignment alternative sub-routes 2 and 3B, which are no longer being considered by the current project (the preferred CO_2 alignment is shown on confidential Figures 64-1 and on non-confidential Figure 68-1). No impacts to these sites are anticipated as a result of the HECA Project.

Reference

Pilling, Arnold, 1950. Archaeological Site Record for P-15-179 (CA-KER-179). University of California Archaeological Research Facility, Berkeley. On file Southern San Joaquin Valley Information Center, California State University, Bakersfield.

BACKGROUND

The AFC (p. 2-17) discusses the proposed carbon dioxide alternative pipelines and the selection, by Occidental of Elk Hills, of a custody transfer point to be located somewhere on the selected carbon dioxide pipeline route alternative. Even if components are outside our jurisdiction, under the California Environmental Quality Act staff must analyze the whole of the project.

DATA REQUEST

72. Please provide a description and discussion of the custody transfer point, including the location, potential extent of ground disturbance (length, width, and depth), and the potential to impact cultural resources.

RESPONSE

The proposed pipeline custody transfer point will be located near existing well head facilities at the Elk Hills Petroleum Reserve at the end of the CO_2 pipeline. The location is presented on Figure 64-1, submitted under confidential cover with the response to Data Request 64.

The proposed pipeline custody transfer point will be adjacent to developed well areas, and the proposed facilities will be located in areas previously developed for the installation of the existing wells. Facilities will consist of an incoming 12-inch CO_2 pipeline terminating at a pig receiver. Additional facilities would include a meter, a cathodic protection test station, a valve manifold, and distribution lines to the wellhead(s). The area of disturbance will not exceed a 50-foot by 100-foot footprint. Structures at the custody transfer point will consist of buried and some aboveground piping. The pipe will generally be buried with 3 to 4 feet of cover. As described in the confidential Appendix H3 of the Revised AFC, no cultural resources were identified at the end of the CO_2 linear, either from the records search or the pedestrian archaeological survey.

BACKGROUND

Section 4.8 of the AFC provides a discussion of potential construction impacts that might occur during the installation of transmission line support structures. It appears that use of either transmission line alternative would make it necessary for the power line to change direction and continue at an angle to the previous route. Staff's understanding is that in situations where a transmission line route turns a corner, there would be potential ground disturbance over a wider area than that ordinarily impacted by the installation of in-line transmission line support structures.

DATA REQUEST

73. Please provide a discussion of the construction techniques likely to be used to accomplish the task of a transmission line turning a corner. Please include the extent of the area likely to experience impacts, the type of equipment to be used, and the depth and width of anticipated disturbance including that due to heavy equipment or access roads.

RESPONSE

When the transmission line is required to turn a corner, a deadend structure will be used. Figure 4-3 of the Revised AFC depicts a deadend structure. The structure will be set so that the axis of the davit arms bisects the angle that the line is turning. For example, if the angle being turned is 90 degrees, then the arms would be turned 45 degrees. The insulators, while not shown on Figure 4-3, will attach to the ends of the davit arms and will generally be positioned horizontally to connect to the conductors.

The deadend structures are planned to be designed to support the lateral forces caused by the conductor tension and weather conditions. Guy wires and guy anchors will not be required.

The deadend structure will be constructed in two or three sections. The base section will be constructed with a flange welded to the base of the section. The base section will be set on a concrete foundation with anchor bolts, which will be bolted to the flange. The subsequent sections will be built so that the upper section will slip over the section below. The sections will be jacked together so that a pre-determined overlap of the sections is achieved.

The structure foundation will be made of concrete with reinforcing steel and anchor bolts. The foundation will be constructed by first digging or auguring a hole in the ground. The hole will likely be 6 to 10 feet in diameter, and 30 to 35 feet deep, depending on the soil conditions and the loads required to be held. The reinforcing steel cage will be fabricated offsite, transported to the site, and placed in the hole with the anchor bolts: concrete will then be poured. The concrete will be left to cure for at least 7 days before the first section of pole is installed on the foundation.

The area disturbed by the construction of the deadend structure will be approximately 150 feet by 150 feet, and will not extended outside the construction ROW, as described in the Revised AFC, Section 4.8.3. This area of disturbance is the same as the area required for construction of the tangent structures. No permanent impact is expected except for the foundations of the transmission line structures. The disturbance will be caused by vehicle and foot traffic around the site. Except for the hole for the structure foundation, the disturbance around the structure construction site will be temporary and superficial on the surface of the ground.

The foundations for the line will be constructed using conventional methods employing heavy construction equipment. The heavy equipment will include truck-mounted foundation-hole drilling machines, tracked excavators, dump trucks, flat-bed tractor-trailer units, concrete trucks, and concrete pumping trucks. Medium-sized earth moving equipment such as front-end loaders will be employed to remove spoil material from the site. The use of heavy equipment during construction will be limited to the construction ROW as described in the Revised AFC.

The tubular steel poles will be set in place using a truck-mounted mobile crane. Alternatively, the poles may be set by helicopter. The choice of crane or helicopter will depend mainly on the selected contractor's preference of work methods.

The conductor and optical ground wires will be installed using specialized truck- and/or trailer-mounted equipment. This equipment includes reel trailers, wire tensioners, and wire pullers.

Throughout the construction, light-duty trucks such as pickups and small flat bed trucks will be used to transport crews, tools, and small equipment between worksites. A lubrication truck will be used to service and fuel the heavy equipment.

BACKGROUND

The applicant sent letters dated June 24, 2008, to notify Native Americans regarding the proposed HECA project. A map, also dated June 24, 2008, identifying the proposed project and linear facility locations was provided as an attachment to those letters. The map dated June 24, 2008, is not the same as the map provided in the Project Description Section of the AFC. The proposed project site has changed. To comment on the project and to facilitate mitigation (should mitigation be necessary), Native Americans need to have accurate project information.

DATA REQUEST

74. Please obtain a current list of Native Americans with heritage ties to the project area from the Native American Heritage Commission. Please send letters accurately describing, and a map accurately depicting, the project and inviting comments from Native Americans.

RESPONSE

The Native American Heritage Commission (NAHC) was contacted about the current Project Site on January 5, 2009 (letter erroneously dated 2008) and responded on January 15, 2009 (also erroneously dated 2008). Although both letters are erroneously dated 2008, the new Contact List attached to the NAHC response is correctly dated January 15, 2009 (see Appendix H3 of the Revised AFC).

The NAHC was contacted about the current HECA Project linears on February 11, 2009, and the NAHC responded on February 13, 2009. The response from the NAHC included a new Contact list dated February 13, 2009.

On April 1, 2009, all Native American groups and individuals identified by the NAHC in both their January 15, 2009 and February 13, 2009 responses were in turn contacted about the HECA Project, and provided with maps depicting the current Project Site configuration for all of the alternative linear alignments.

This information is described and presented in both the Revised AFC and the confidential archaeological survey report attached to the Revised AFC as Appendix H3 (May 2009).

The NAHC will be contacted regarding modified transmission routes 1A and 1B. Letters, including a map depicting the modified routes and a request for comments, will be sent to Native American groups and individuals identified by the NAHC.

DATA REQUEST

75. Please provide to staff copies of the information sent to Native Americans and provide copies of any comments received from Native Americans. If comments are received via telephone, please provide a brief summary of any conversations.

RESPONSE

Letters and maps depicting the currently defined HECA Project (Project Site and linears) sent to the NAHC, and Native American groups and individuals identified by the NAHC, are attached to the confidential archaeological survey report submitted to the Commission as Appendix H3 of the Revised AFC (May 2009).

BACKGROUND

A recent synthesis of archaeological and geoarchaeological information on the California Central Valley ("The Central Valley: A View from the Catbird's Seat," by Jeffrey S. Rosenthal, Gregory G. White, and Mark Q. Sutton, in *California Prehistory: Colonization, Culture, and Complexity* (Terry L. Jones and Kathryn A. Klar, eds., 2007), suggests that prehistoric deposits in the Central Valley dating before 2,500 years ago have either been obliterated by agricultural activities or buried by ongoing alluvial processes (p. 150).

The construction of the HECA Project would entail ground disturbance of the 473-acre project site and project linear facilities. The project site and much of the area traversed by the proposed liner facilities are covered by late Quaternary alluvium (AFC, pp. 5.16-5 and 5.16-11; Figure 5.15-1), potentially obscuring archaeological sites. Staff assumes parts of the project site and project linear facilities rights of way (ROWs) have been disturbed by agriculture to a depth of 3 feet, but considerable project ground disturbance would exceed that depth. The ground disturbance resulting from the construction of equipment installations at the plant site would be likely to extend as deep as 12 feet below the surface. The 8-mile-long gas and potable water pipelines would be installed together in a trench at least 5 feet below grade. The 15-mile-long process water pipeline would presumably be installed at least 5 feet below grade. The carbon dioxide pipeline would also be buried approximately 5 feet below the ground surface, and the directional drilling used to install the carbon dioxide pipeline below canals and rivers would extend to a depth of 100 feet. The amount of relatively deep ground disturbance proposed in an area sensitive for archaeological resources is considerable.

Although the Archaeological Resources Report acknowledges that archaeological deposits could be inadvertently exposed during construction activities, the Cultural Resources section of the AFC and the Archaeological Resources Report provide no information on the potential for the construction of the proposed project to truncate archaeological deposits that may lie buried beneath the surface of the project area. These deposits may be too deep to present surface manifestations, but may be within reach of construction impacts. Staff needs information of a finer resolution on the age, the structure, and the character of the geologic units beneath the surface of the project area to evaluate the project's potential to substantially and adversely change the CRHR-eligibility of archaeological deposits that may lie buried in the project ROWs.

DATA REQUEST

76. Please obtain the services of a professional in geoarchaeology: a person who, at a minimum, meets the U.S. Secretary of Interior's Professional Qualifications Standards for prehistoric archaeology, as published in Title 36, Code of Federal Regulations, part 61, and includes the completion of graduate-level coursework in geoarchaeology, physical geography, geomorphology, or Quaternary science, or education and experience acceptable to cultural resources staff. Please submit the resume of the proposed geoarchaeologist for staff review and approval.

RESPONSE

URS Corporation has on staff Mr. Jay Rehor, a professional geoarchaeologist. Mr. Rehor's résumé is included as Attachment 76-1.

ATTACHMENT 76-1

DATA REQUEST

77. Please have the approved geoarchaeologist provide a discussion, based on the available Quaternary science and geoarchaeological literature, of the historical geomorphology of the project ROWs.

A. Describe the development of the landforms on which the ROWs are proposed, with a focus on the character of the depositional regime of each landform since the Late Pleistocene epoch.

B. Provide data on the geomorphology, sedimentology, pedology, hydrology, and stratigraphy of the ROWs, and the near vicinity. The discussion should relate landform development to the potential in the ROWs for buried archaeological deposits.

C. Provide overlaying the above data on the project ROWs.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

78. In the absence of sufficient extant Quaternary science and/or geoarchaeological literature pertinent to the reconstruction of the historical geomorphology of the project area, please have the approved geoarchaeologist design a primary geoarchaeological field study of the project ROWs. Submit a research plan for staff approval, and conduct the approved research. The purpose of the study is to facilitate staff's assessment of the likelihood of the presence of archaeological deposits buried deeper than 3 feet in the project's ROWs. The primary study and resulting report should, at a minimum, include the following elements:

A. A map of the present landforms in the project area at a scale of not less than 1:24,000; the data sources for the map may be any combination of published maps, satellite or aerial imagery that has been subject to field verification, and the result of field mapping efforts;

B. A sampling strategy to document the stratigraphy of the portions of the landforms in the project ROWs where the construction of the proposed project will involve disturbance at depths greater than 3 feet;

C. Data collection necessary for determinations of the physical character, the ages, and the depositional rates of the various sedimentary deposits and paleosols that may be beneath the surface of the project ROWs to the proposed maximum depth of ground disturbance. Data collection at each sampling locale should include a measured profile drawing and a profile photograph with a metric scale, and the screening of a small sample (3 5-gallon buckets) of sediment from the major sedimentary deposits in each profile through ¼-inch hardware cloth. Data collection should also include the collection and assaying of enough soil humate samples to reliably radiocarbon date a master stratigraphic column for each sampled landform; and

D. An analysis of the collected field data and an assessment, based on those data, of the likelihood of the presence of buried archaeological deposits in the project ROWs, and, to the extent possible, the likely age and character of such deposits.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

79. Please have the approved geoarchaeologist prepare a report of the primary field study and submit it to staff under confidential cover.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

Technical Area: Efficiency
Author: Steve Baker

BACKGROUND

Solid fuel and other feedstocks will be delivered to the plant by truck and by train. Solid byproducts and waste materials will be removed from the project by truck. The fuel consumed by these trucks represents a significant energy use, and affects the overall fuel efficiency of the project.

DATA REQUEST

80. Please quantify the amount of diesel fuel that will be consumed each year by trucks and trains to provide necessary transportation of fuel, feedstocks, byproducts, waste materials and any other such materials to and from the project.

RESPONSE

The current transportation practices estimated to be displaced are described in detail in Table 5.1-24 of the Revised AFC.

There will be an estimated 4,841,608 gallons per year diesel fuel use in trucks resulting from displacing current truck practices, and an estimated 264,029 gallons per year diesel fuel use in rail resulting from displacing current rail practices. The diesel fuel estimate requested is provided in Table 80-1.

Table 80-1
Estimated Diesel Fuel Use

HECA Transportation Method	Estimated Amount of Fuel (gallons/year)
Trucks	
Current Scenario	1,116,946
HECA Scenario	5,958,554
Difference	*4,841,608*
Rail	
Current Scenario	246,409
HECA Scenario	510,438
Difference	*264,029*

The amount of fuel for the trucks transporting fuel, feedstocks, byproducts, waste materials, and other materials to and from the Project Site for the Current Practice Scenario, and the HECA Scenario was estimated using the diesel carbon content for motor vehicles. The diesel carbon content was found to be 2,778 grams per gallon, and the value was obtained from U.S. EPA's Office of Transportation and Air Quality document "Average Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel," February 2005.

The amount of fuel for the rail system transporting feedstock to and from the Project Site for the Current Practice Scenario and the HECA Scenario was estimated using the average locomotive fuel efficiency. The average locomotive fuel efficiency was found to be 0.13 mile per gallon, and the value was obtained from the National Transportation Statistics for Locomotives, Table 4.17: Class I Rail Freight Fuel Consumption and Travel (http://www.bts.gov/publications/national_transportation_statistics).

The current transportation practices estimated to be displaced are described in detail in Table 5.1-24 of the Revised AFC.

Technical Area: Geology and Paleontology
Author: Michael S. Lindholm, P.G.

BACKGROUND

The Confidential Paleontological Resources Technical Report, provided separately from the AFC, states that several paleontological archival records searches were conducted for Hydrogen Energy California (HECA) by the San Bernardino County Museum, the Los Angeles County Natural History Museum, and the University of California Museum of Paleontology. These reports provide an inventory of paleontological resources in the museum's collection from the proposed plant site and project linears, as well as from geological units in the surrounding area that are present on the site. The reports also give independent assessments of the paleontological sensitivity of geological units and the potential for impacting any paleontological resources.

DATA REQUEST

81. Please provide a copy of the archival records search reports prepared by the San Bernardino County Museum, the Los Angeles County Natural History Museum, and the University of California Museum of Paleontology.

RESPONSE

The museum records received from the University of California at Berkeley Museum of Paleontology, and from the San Bernardino County Museum are provided as Attachments 81-1 **(submitted under separate confidential cover)** and 81-2. The Los Angeles County Museum search request did not produce any locality information, and therefore no report was received.

ATTACHMENT 81-2

BACKGROUND

Injection of fluids into subsurface formations, as is proposed for HECA as part of the CO_2 sequestration plan, may have the effect of increasing the seismicity in the area. Commonly, faults in the vicinity of the injected fluids may experience more frequent, but lower magnitude earthquakes. An internal report prepared for Hydrogen Energy International, LLC by Terralog Technologies USA, Inc., titled *Potential for Induced Seismicity from CO_2 Injection Operations at Elk Hills* is referenced in Section 5.15, Geological Hazards and Resources of the AFC. This report could be useful in evaluating the geologic hazards that might result from injection of CO_2 produced by HECA.

DATA REQUEST

82. Please provide a copy of the Terralog Technologies USA, Inc. report titled **Potential for Induced Seismicity from CO_2 Injection Operations at Elk Hills** ***that is referenced in the AFC.***

RESPONSE

This document will be filed separately under confidential cover.

Technical Area: Hazardous Materials
Author: Dr. Alvin Greenberg

BACKGROUND

Table 5.12-5 lists the frequency of hazardous materials deliveries and states for aqueous ammonia the maximum number of deliveries per hour, per 24-hour period, and per year. However, this information is confusing and contradictory. To assess the risk of hazardous materials transportation to workers and the public, staff needs to know the maximum number of deliveries on a daily, weekly, and yearly basis.

DATA REQUEST

83. Please clarify the number of deliveries of aqueous ammonia on a daily, weekly, and annual basis.

RESPONSE

This response supplements and refines the information provided in the Table 5.12-5 of the Revised AFC. The forecasted deliveries are based on a truck capacity of 6,700 gallons (19 weight percent aqueous ammonia), a maximum annual aqueous ammonia consumption of 1,100,000 gallons, and an average annual consumption of 750,000 gallons of aqueous ammonia. The capacity of the aqueous ammonia storage tank capacity is 20,000 gallons. Table 83-1 presents the forecast average and maximum deliveries of aqueous ammonia on a daily, weekly, and annual basis.

Table 83-1
Average and Maximum Deliveries of Aqueous Ammonia

	Average	Maximum
Daily Deliveries (trucks)	1	1
Weekly Deliveries	3	7[1]
Annual Deliveries	112	165

Note:

[1] The maximum weekly delivery assumes initial fill of the 20,000-gallon aqueous ammonia storage tank followed by 7 days at maximum ammonia consumption.

BACKGROUND

The Off-site Consequence Analysis (OCA) for aqueous ammonia did not include the estimated distance to the staff's benchmark exposure level of 75 ppm; 200 ppm is the lowest concentration modeled. Also, a map (figure) depicting the distances to each modeled concentration in visual format was not provided. Staff needs this information in order to fully and completely assess the risk of hazardous materials storage to workers and the public.

DATA REQUEST

84. Please provide OCA modeling results for an ammonia spill in map format showing the distances to each modeled concentration including staff's benchmark level of 75 ppm.

RESPONSE

To assess the potential impacts associated with a worst-case accidental release of ammonia, The Applicant modeled three "benchmark" exposure levels for ammonia gas for an offsite consequence analysis in accordance with applicable regulations. These include:

1. Lowest concentration posing a risk of lethality; 2,000 ppm;
2. Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; and
3. Emergency Response Planning Guideline (ERPG) level 2 of 200 ppm, which is also the Risk Management Program (RMP) Level 1 criterion used by the U.S. EPA and State of California Planning Agencies.

These three exposure levels (i.e., 2,000 ppm, 300 ppm, and 200 ppm) were modeled and presented in the Revised AFC in Section 5.12.2.3, Appendix L, and Figure L-1, and the modeling showed that such concentrations from a worst-case release scenario would not extend beyond the Project Site boundaries.

The 75 ppm level considered by the CEC staff to be without serious adverse effects on the public for a one-time exposure has been modeled in response to this data request using the same methodology that was used for the levels presented in the Revised AFC. Modeling results for the 75 ppm exposure level also showed that the potential area of impact resulting from an ammonia worst-case release scenario would remain within the boundaries of the Project Site.

Table 84-1 summarizes the modeling results for all levels of concern.

Table 84-1
Summary of Offsite Consequence Analysis Modeling Results

Level of Concern (ppm)	Impact Radius distance (feet)
75	318
200	189
300	162
2,000	60

Therefore, there will be no offsite impact for a worst-case accidental ammonia release at any of the exposure levels modeled. Figure 84-1 shows on a 1:24,000 scale the potential impact areas of each of the four modeled ammonia concentrations.

Figure 84-1 (front)

Figure 84-1 (back)

Technical Area: Public Health
Author: Dr. Alvin Greenberg

BACKGROUND

The AFC did not provide diesel particulate matter (DPM) emission factors for equipment and vehicles that will be used during construction activities nor was a health risk assessment prepared for diesel emissions from construction activities. Table 5.1-10 of the AFC provides modeling results for combustion sources during construction activities for criteria pollutants, including PM10 and PM2.5, but not DPM. While staff understands that project construction emissions are short-term and may indeed pose an insignificant risk to public health as the AFC states, staff needs to verify this by reviewing the DPM emission factors and health risk assessment for construction activities.

DATA REQUEST

85. Please provide DPM emission factors from construction activities, the AERMOD air dispersion results (Chi/Q in ug/m^3 per g/sec) at the PMI, MEIR and MEIW (as defined in data requests 86, 87, and 88 below), and a health risk assessment for diesel construction equipment emissions.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

Public health impacts are modeled in the Health Risk Assessment at grid receptors located outside of both the Project Site and the Controlled Area. Impacts should also be determined for the Point of Maximum Impact (PMI) regardless of whether it occurs inside or outside of the Project Site and Controlled Area. Impacts at the location of the Maximally Exposed Individual Worker (MEIW) should likewise be determined.

DATA REQUEST

86. Please provide the location (in UTM coordinates), the AERMOD air dispersion results (Chi/Q in ug/m^3 per g/sec) at that location, and the estimated cancer risk, chronic hazard index and acute hazard index at the Point of Maximum Impact within the Project Site area, within the Controlled Area, and outside of both areas.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

87. Please provide the location (in UTM coordinates), the AERMOD air dispersion results (Chi/Q in ug/m3 per g/sec) at that location, and the estimated cancer risk, chronic hazard index and acute hazard index at the MEIW within the Project Site area, within the Controlled Area, and outside of both areas.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

Staff identified two potential nearest Maximally Exposed Individual Residents (MEIRs). One is located next to the facility to the northwest and is evaluated in the AFC. The applicant is attempting to purchase this property. The other nearest residence is located east of the Project Site, at the intersection of Station Road and Tupman Road. The location of this residence should also be evaluated in the HRA for public health impacts.

DATA REQUEST

88. Please provide the location (in UTM coordinates), the AERMOD air dispersion results (Chi/Q in ug/m^3 per g/sec) at that location, and the estimated cancer risk, chronic hazard index and acute hazard index at the nearest residence located at the intersection of Station Road and Tule Park Road.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

The AFC identifies all HECA Toxic Air Contaminant (TAC) emission sources on page 5.6-10 of the Revised AFC under the subheading “Stationary Sources.” Staff is concerned that not all sources are contained in that list. Staff needs a list of all source, all TACs emitted from those sources, and all emissions factors in order to properly and fully asses the potential for impacts to workers and the off-site public.

Also, Tables 5.6-2 through 13 show that emissions factors of TACs emitted from the facility are derived from various sources including EPA AP-42 tables, the Ventura County APCD, CARB CATEF tables, and the project itself (“HECA Project”). Staff needs to know the basis for all decisions to use these sources of emissions factors and whether for an explanation of the project itself can serve as a source of information.

DATA REQUEST

89. Please provide an updated list of all sources of TACs in tabular format listing the source, the identify of the TAC, and the emission factor. Please include all fugitive emissions of TACs from valves and flanges (especially hydrogen sulfide) and from all mobile sources (such as DPM from the trucks that would deliver petcoke and coal feedstock to the facility). Please use the maximum number of truck deliveries expected to and from the facility. (Mobile sources can be modeled as an area source in the facility fenceline and when within 0.1 mile of the facility.)

RESPONSE

As described in *Applicant’s Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

90. Please provide a discussion to support the choice of emission factors and explain why emission factors from a similar facility were not used.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

Three flares are proposed for use at the emission point of pressure relief valves. Flares are a constant source of TACs, must be burning all the time, and provide incomplete combustion. The risk due to the production of TACs is included in the HRA. Staff needs to know the rationale for these flares and why collection, compression, and storage for recycling with a back-up flare to prevent over-pressure was not an option considered.

DATA REQUEST

91. Please provide a rationale for not designing a pressure relief valve capture and recycling system for the three sources.

RESPONSE

Flare gas recycle systems are sometimes used when purging is done with natural gas, or when continuous process vents are directed to flare. Rather than the more traditional design approach of directing process vents to flare and then adding an "end-of-vent-pipe" clean-up, capture, and recycle system, the HECA Project selected a far more progressive design approach for its three flare systems—avoid directing continuous process vents to flare, and use a nitrogen purge instead of a natural gas purge. With no continuous process vents and no natural gas purge, no gases need to be captured and recycled. Therefore, no decrease in regulated emissions would be achieved from these streams if a capture and recycle system were installed.

In addition to the above, each of the three relief and flare systems have different characteristics that make recycling unnecessary or impractical for transient operations. The rationale for not including a pressure relief valve and recycling system for each flare system follows.

Gasification Flare System

The Gasification Flare System is required for infrequent and transient situations for emergency overpressure protection and safe startup and shutdown of the Gasification, Shift/Low Temperature Gas Cooling, Mercury Removal, and Acid Gas Removal Units. In the case of emergency protection, it would be unsafe to install a recovery system on such streams. The Gasification Flare System is used during infrequent startup and shutdown of the Gasification Block following maintenance outages, and is also used briefly when an individual gasifier is shut down and the spare gasifier is started. A recycle system is not viable for safety reasons, given the large size and transient nature of the streams involved, and the transient nature of the operation of the HECA Project during these infrequent occasions.

Rectisol Flare System

The Rectisol flare system is dedicated to the Acid Gas Removal Unit and is only required for emergency overpressure protection; it would be unsafe to install a recovery system on such emergency streams. There are no scenarios in which there would be a need for flaring during steady-state operation or startup and shutdown.

SRU Flare System

The SRU Flare System is required both for emergency overpressure protection and safe startup and shutdown of the SRU. The startup acid gases are passed through a caustic scrubber before going to the SRU Flare. The caustic scrubber will remove all but traces of H_2S and nearly all of the CO_2 in the startup gases. Because the acid gas stream is composed of mostly H_2S and CO_2, the gas stream actually going to the flare tip will be essentially inert gases (nitrogen and argon). In the case of emergency protection, it would be unsafe to install recovery system on such streams.

Technical Area: Reliability
Author: Steve Baker

BACKGROUND

The General Electric Frame 7FB gas turbine must be started on natural gas before it can be operated on hydrogen. The AFC explains (§ 2.1.8.3, page 2-14) that pressure in the natural gas supply pipeline is adequate to power this machine only 95.8 percent of the time. No gas compressor will be provided to ensure adequate pressure to this machine.

DATA REQUEST

92. Please describe and quantify the likely impact on project generating reliability due to the possibility that gas pressure may be inadequate to start the Frame 7FB gas turbine.

RESPONSE

Table 2-27, Operational Modes, in the Revised AFC provides a 20-year forecast of power availability and production from both hydrogen-rich fuel and natural gas. The average total power availability over 20 years is forecast to be 92.2 percent, including both hydrogen-rich fuel and natural gas operation. The hydrogen-rich fuel power availability over 20 years is forecast to be 85 percent, with the remaining 7.2 percent of the availability provided by natural gas. Approximately 7.2 percent of the time, power production may be susceptible to low natural gas supply pressure.

Two large natural gas pipeline systems (Pacific Gas and Electric Company [PG&E] and Southern California Gas Company [SoCalGas]) are available to supply natural gas to the project:

PG&E Pipeline

The HECA Project recently received historical data for the PG&E pipeline covering the last 3 years. The historical data indicate that the minimum gas pressure will be above the minimum gas pressure required at the HECA Project metering station.

SoCalGas Company Pipeline

The estimated minimum pressure for the SoCalGas Company pipeline supply is expected to be 350 pounds per square inch gauge (psig). However, the historical data from 2008 indicate that 95.8 percent of time the SoCalGas pipeline pressure will be above 500 psig. The natural gas supply pressure requirement for baseload operation is 400 psig at the CTG fuel supply interface. Less natural gas pressure is expected to be needed to start the CTG and load it to the level needed to transfer to hydrogen-rich fuel.

The following assumptions can be used to quantify the potential impact of low natural gas supply pressure from the SoCalGas pipeline. Natural gas is needed for power production or to start and load the CTG 7.2 percent of the time, or an average of about 630 hours per year. During those 630 hours when natural gas is required, based on the above data, the pressure is potentially insufficient for 4.2 percent of the time, or about 26 hours. The 26 hours per year of lost power production is equivalent to a reduction in availability of about 0.3 percent. During this period, the gas turbine will not operate.

In summary, the historical pipeline pressures for the PG&E pipeline indicate that the natural gas pressure should be adequate virtually all of the time, and would have no impact on HECA Project generating reliability. The historical pipeline pressures for the SoCalGas Company pipeline indicate that the HECA Project generating reliability could be theoretically reduced by 0.3 percent due to insufficient gas pressure, and this would have a negligible impact on operability.

Technical Area: Socioeconomics
Author: Scott Debauche

BACKGROUND

Section 5.8.1.3 indicates that Hall Ambulance Service in Bakersfield will respond to the project site if an ambulance service is required. It is vague whether that would be for project construction and operation.

DATA REQUEST

93. Please provide protocol for on-site first responder emergency medical care during both project construction and operation.

RESPONSE

As described in Sections 2.6.1.4 and 2.7.2 of the Revised AFC, emergency response services will be coordinated with the local fire department, ambulance companies, and local hospitals and clinics—during both HECA Project construction and operation. Prior to commencement of construction activities, the Applicant, and the assigned contractors and operations and management staff will meet and develop a site-specific construction emergency response program. A review of the developed program with local government emergency response organizations will ensure completeness and proper coordination.

During HECA Project construction, the Applicant's Engineering, Procurement, and Construction contractor will be responsible for providing site security, health and safety training, and site first aid services. First-aid kits will be conveniently located around the Project Site, and will be maintained regularly. At least one person trained in first aid will be part of the construction staff upon mobilization, and additional personnel with appropriate skills for site first aid and medical support (nurse and/or medical practitioner) will be added as the construction crew size increases. All foremen and supervisors will be required to have first-aid training.

Health, Safety, Security, and Environment goals aim to reduce the need for emergency medical care services by motivating workers to work safely and protect long-term health, as well as to identify hazards and manage risks on the Project Site. Emergency preparedness includes the development of a communications and response plan for emergency situations during HECA Project operation, including identification of area hospitals and clinics and coordination with local emergency response organizations in Bakersfield and elsewhere in Kern County.

If first aid is required for minor accidents or incidents on site during HECA Project construction or operation, it will be provided by the appropriately trained HECA Project personnel, if possible. For incidents requiring greater resources or medical attention, injured workers will be transferred to a designated local clinic for non-urgent care; for more serious or life-threatening situations, 911 will be called.

Kern County's Emergency Medical Services (EMS) Department is the lead agency for the EMS system in Kern County, and is the agency responsible for coordinating all system participants in the County, including fire departments, ambulance companies, hospitals, and other service providers. All 911 calls are routed to the County's Emergency Communications Center, where detailed EMS protocols and procedures are followed to dispatch fire trucks and ambulances, or in some circumstances, a medical evacuation helicopter service. For most medical emergency situations, both the closest fire station and the local ambulance company (Hall Ambulance Service in Bakersfield) would also be dispatched. Given average response times to the site, it is likely that the local fire department emergency medical technicians would arrive on the scene initially and provide first response services. Once the ambulance arrives, the Hall Ambulance Service paramedics would be the medical providers on the scene. They would provide advanced life support services as needed on site and during patient transport to an appropriate medical facility (Kern County, 2009; Searfoss, 2009).

References

Kern County, 2009. "County of Kern Emergency Medical Services Policies, Procedures, and Protocols." http://www.co.kern.ca.us/ems/policy.asp. Accessed October 13, 2009.

Searfoss, Ed, Paramedic Supervisor, Hall Ambulance Service, Inc. Personal communication with Mara Feeney, Mara Feeney & Associates. October 13, 2009.

Technical Area: Soil and Water Resources
Author: Cheryl Closson

BACKGROUND

To help determine the potential impacts to soil and water resources from the construction and operation of a power plant project, the Energy Commission staff generally requests that the applicant prepare a draft Drainage, Erosion and Sediment Control Plan (DESCP). The DESCP would be a separate document from any Construction and/or Industrial Storm Water Pollution Prevention Plans (SWPPP) required under the federal National Pollutant Discharge Elimination System (NPDES) program, unless an applicant intends to combine the DESCP and any required SWPPPs into one document. Once a project is approved, the draft DESCP would be required to be updated and revised as the project moves from the preliminary to final design phases, on through to construction and operation of the facility. In addition, the DESCP submitted prior to site mobilization would be required to be designed and sealed by a professional engineer/erosion control specialist.

While the HECA project applicant has submitted a preliminary storm water drainage plan (Figure 2-36), a preliminary grading plan (Figure 2-41), and a preliminary hydrology study (Appendix O3) as part of the project AFC, more information is needed to fully assess the adequacy of the erosion control and storm water management features and mitigation proposed for project activities and operation.

DATA REQUEST

94. Please identify whether or not the project will prepare a combined SWPPP and DESCP document, or if the plans will be prepared and maintained separately.

RESPONSE

The Applicant will provide separate SWPPP and Drainage, Erosion and Sediment Control Plan (DESCP) documents. A draft DESCP is being submitted in response to Data Request 95. A Construction SWPPP will be provided as a post-certification submittal. This is requested to allow for finalization of the Project Site and construction facilities design during detailed engineering. The Operations SWPPP will be prepared and submitted at least 60 days before commencement of commercial operations of the facility.

Please see response to Data Request 95 for additional information.

DATA REQUEST

95. Please provide a draft DESCP that contains elements "A" through "I" below outlining the site management activities and erosion/sediment control Best Management Practices (BMPs) to be implemented during site mobilization, grading, construction, and operation of the proposed project (including linear features). The level of detail in the draft DESCP should be commensurate with the current level of planning for site grading and drainage. Please provide all conceptual erosion control information for those phases of construction and operation that have been developed or provide a statement identifying when such information will be available.

A. Vicinity Map – Provide a map(s) at a minimum scale 1"=100' indicating the location of all project elements, including depictions of all significant geographic features including swales, storm drains, and sensitive areas. (Note: Smaller map scales may be used for linear features due to the large distances covered by some of the features. Large scale inserts may be used to highlight detail for areas of concern, etc.)

B. Site Delineation – Identify all areas subject to soil disturbance (i.e., project site, lay down areas, all linear facilities, landscaping areas, and any other project elements) and show boundary lines of all construction/demolition areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

C. Watercourses and Critical Areas – Show the location of all nearby watercourses including swales, storm drains, and drainage ditches. Indicate the proximity of those features to the project construction, laydown, and landscape areas, and all transmission and pipeline construction corridors.

D. Drainage Map – Provide a topographic site map(s) at a minimum scale 1"=100' showing all existing, interim and proposed drainage systems and drainage area boundaries. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours should be extended off-site for a minimum distance of 100 feet in flat terrain. (Note: Smaller map scales may be used for linear features due to the large distances covered by some of the features. Large scale inserts may be used to highlight detail for areas of concern, etc.)

E. Narrative Discussion of Project Site Drainage – Include a narrative discussion of the drainage management measures to be taken to protect the site and downstream facilities. The narrative should include the summary pages from the hydraulic analysis prepared by a professional engineer/erosion control specialist. The narrative should state the watershed size(s) (in acres) that was used in the calculation of drainage control measures, and include discussions justifying selection of the control measures to be used. Information from the hydraulic analysis should also be provided to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the project construction and laydown area, as well as post-construction and operation areas.

F. Clearing and Grading Plans – Identify all areas to be cleared of vegetation and areas to be preserved. Provide elevations, slopes, locations, and extent of all proposed grading using contours, cross sections or other means and include locations of any disposal areas, fills, or other special features. Illustrate existing and proposed topography tying in proposed contours with existing topography.

G. Clearing and Grading Narrative – Include a table that identifies all of the following: all project elements where material will be excavated or fill added; the type and quantities of material to be excavated or filled for each element; whether the excavation or fill is temporary or permanent; and the amount of material to be imported or exported.

H. Construction Best Management Practices Plan – Identify on the topographic site map(s) the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). The BMPs identified should include measures designed to prevent wind and water erosion in areas with existing soil contamination. Any treatment BMPs used during construction should also allow for testing of storm water runoff prior to discharge to receiving water.

I. BMP Narrative – Provide a narrative discussion on the selection, location, timing, and maintenance schedule for all erosion and sediment control BMPs to be used prior to initial grading, during project element excavation and construction, at final grading/stabilization, and for post-construction. A narrative discussion with supporting calculations should also be included addressing any project specific BMPs. Separate BMP implementation schedules should be provided for each project element for each phase of construction. The maintenance schedule should include post-construction maintenance of structural control BMPs or a statement when such information will be available.

RESPONSE

A draft DESCP has been prepared and is provided as Attachment 95-1. The draft DESCP addresses items “A” through “I”.

ATTACHMENT 95-1

BACKGROUND

Page 5.9-14 of the project AFC states that approximately 1.1 million cubic yards of soil required for project construction will be imported from offsite sources. The potential source identified for procuring the necessary fill material is Syndex Ready Mix, a commercial aggregate company located approximately five miles west of the project site. Staff needs to clarify if the project will only be using commercial aggregate companies for project fill material or if non-commercial borrow sites will also be used for any project construction fill material. In the event that non-commercial borrow sites are to be used, staff would need documentation that any proposed fill material is clean and uncontaminated prior to use of the material by the project.

DATA REQUEST

96. Please clarify whether or not the HECA project will use non-commercial fill material sources for any project-related activities. If non-commercial fill borrow sites are to be used for the project, please identify the steps the project will take to ensure that any fill material is certified to be clean and uncontaminated.

RESPONSE

As stated in Section 5.9 of the Revised AFC, the Applicant currently plans to acquire soil from a commercial aggregate company and from re-use of onsite soil from grading activities. In the event that non-commercial fill sources are identified and selected for HECA Project use, the Applicant will collect and analyze samples to ensure that any fill material is clean and uncontaminated.

BACKGROUND

The project AFC states that the West Kern Water District (WKWD) will provide potable water for both the project construction water needs as well as the potable water supply for facility operation. However, the AFC does not include a copy of a will-serve letter or water supply contract from WKWD confirming that that the district has the necessary water and is willing to supply the water to the project. In addition, the AFC states that the potable water for construction would be transported to the project site via the proposed potable water pipeline. Staff needs additional information on what alternative construction water supplies could be used by the project in lieu of potable water, as well as how and what water will be used for construction of the project linears, including construction of the potable water pipeline.

DATA REQUEST

97. Please provide additional information on the availability and feasibility of using alternative water supplies (such as treated municipal wastewater) for project construction activities in lieu of using potable water.

RESPONSE

The Project Site is approximately 17 miles northeast of the City of Bakersfield Wastewater Treatment Plant #3. This plant treats a portion of the municipal effluent generated from the City of Bakersfield. The current design capacity of this plant is 16 million gallons per day (mgd). The existing facility provides primary and secondary treatment of incoming wastewater. The secondary treated effluent is used for irrigation on 400 acres of City-owned land adjacent to the treatment plant facility and is provided by contract to the City of Los Angeles for crop irrigation on 4,700 acres of land alongside Interstate 5 (I-5). The I-5 site uses 14 mgd, with the remaining 2 mgd used near the plant.

The City is in the process of expanding and upgrading Wastewater Treatment Plant #3. Upon completion of the expansion project, the design treatment capacity of the plant will be increased to 32 mgd to accommodate potential future growth. The project also includes improvements to the primary and secondary treatment systems, as well as a 2 mgd tertiary treatment facility to produce recycled water for use on nearby landscaping and at the wastewater treatment plant. In August 2009, the Central Valley Regional Water Quality Control Board issued Waste Discharge Requirements (WDR) Order No. R5-2009-0087 for Wastewater Treatment Plant #3 to cover discharges from the existing and expanded plant.

WDR No. R5-2009-0087 specifies that the use of secondary treated wastewater effluent is limited to flood irrigation of crops that are not intended for human consumption or for grazing of non-milking cattle. Public contact with secondary treated wastewater is prohibited.

While the City of Bakersfield may have secondary treated municipal wastewater available in the future, the City cannot guarantee availability and the Applicant is concerned with the personnel exposure hazard associated with using the wastewater for construction purposes. It is expected that personnel will come into occasional contact with construction water and City of Bakersfield municipal effluent is not appropriate for human contact. As stipulated in WDR No. R5-2009-0087, direct contact with the effluent from the City's plant is prohibited.

Other municipal wastewater treatment plants in Kern County are much smaller than Bakersfield's Wastewater Treatment Plant #3 and are not able to provide the necessary quantity of water to the HECA Project.

DATA REQUEST

98. Please provide additional information on the water supplies and transport mechanisms to be used for construction of the project linears.

RESPONSE

As discussed in Section 5.14.1.6 of the Revised AFC, the average daily water use during construction of the Project Site (compaction, dust control, hydrotesting and sanitary purposes) is estimated to be 10,000 gallons per day (gpd). During hydrotesting, maximum daily water use is expected to be approximately 100,000 gallons. During construction of the Project Site, the water will be transported to the site by pipeline.

For construction of the Project linear facilities, the water supply is anticipated to come from the WKWD. The water will be transported via truck.

DATA REQUEST

99. Please provide a water supply contract or will-serve letter from the WKWD stating that the district is willing to provide potable water to the HECA project for construction water use.

RESPONSE

A will-serve letter from WKWD stating that the district will provide potable water during construction and operation of the HECA Project is provided in Attachment 99-1.

ATTACHMENT 99-1

DATA REQUEST

100. Please provide a water supply contract or will-serve letter from the WKWD stating that the district is willing to provide potable water to the HECA project for facility operation potable water uses for the life of the project.

RESPONSE

A will-serve letter from WKWD staffing stating that the district will provide potable water during construction and operation of the HECA Project is provided in response to Data Request 99 as Attachment 99-1.

DATA REQUEST

101. Please provide detailed construction water use estimates for project site construction needs, as well as project horizontal directional drilling (HDD) activities and any other water uses for project linear construction. The construction water use estimates should be submitted both in narrative format and in a table that clearly shows estimated water use for each of the main project construction activities (i.e., grading, dust suppression, HDD, trenching, hydrotesting, or other major water use activities, etc.), water source, and method of delivery to be employed to transport the water to the use site.

RESPONSE

Table 101-1 provides details for the estimated construction water use for the activities associated with construction of the Project Site and the linears. These quantities reflect refinement of the estimate originally presented in the Revised AFC. WKWD will be the supplier of this water, as reflected in the will-serve letter presented in the response to Data Request 99. Water will be transported to the linear construction sites and to the Project Site via truck until the construction of the potable water pipeline is complete. The average daily water use over the 37-month construction period is estimated as follows:

Project Site

1. Water use is estimated to be 24,000 gpd during the first 2 months of construction, reducing to 14,000 gpd for the following 4 months. Construction activities during this phase include site grading, underground work, and dust control.

2. During the next 24 months, water use is estimated to be 12,000 gpd. Construction activities during this phase include day-to-day construction, foundations, backfill, compaction, dust control, and road cleaning.

3. Over the following 4 months, water use for the hydrostatic testing of the equipment and plant piping is estimated to be approximately 5,600 gpd.

4. In the final 3 months of construction, water use for final grading, construction cleanup, and ongoing dust control is estimated to be approximately 8,000 gpd.

Linears

An average construction water use of 900 gpd is estimated over a 6-month period for the construction of linear systems; this includes backfill/compaction of the trenches and dust control. An additional 2,300 gpd of water is estimated to be required for the HDD. The average water use for hydrotesting the linear systems is estimated to be 2,000 gpd over a period of 6 months. This estimate is based on reuse of the water where possible. For example, water used to hydrotest portions of a pipeline would be re-circulated back to a holding water truck to be used on subsequent portions of the pipeline.

Construction of the linear systems is expected to take place within the 37-month overall Project construction schedule.

Table 101-1
Estimated Construction Water Use

Activity	Estimated Daily Average Use by Construction Phase (gpd)	Estimated Construction Phase Duration (Months)	Daily Average Over Construction Period (gpd)	Estimated Water Use in acre-feet	
				12-Month Period Maximum Use	Monthly Average Over Construction Period
Project Site (473 acres)					
Early Works • Initial Grading of Entire Site • Dust Control	24,000	2	11,800[(1)]	12	10
Site Preparation • Underground • Excavation/Backfill/Compaction • Dust Control	14,000	4			
Ongoing Day-to-Day Construction • Foundations • Backfill • Compaction • Dust Control • Road Cleaning	12,000	24			
Finishing Stage • Finish Grading and Paving • Landscaping • Construction Cleanup • Demobilization Dust Control	8,000	3			
Hydrotest – Plant Equipment and Piping	5,600	4			
Linear Construction					
Trenching	900	6	2,000	1.5	N/A
Horizontal Directional Drilling	2,300	3			
Hydrotest – Linears	2,000	6			

Notes:
1 Daily average use after the first 12 months of construction, including construction of linears is estimated at 10,000 gpd.
gpd = gallons per day
N/A = not applicable

BACKGROUND

Appendix O1 provides a signed summary document of the proposed water transfer terms between the Applicant and Buena Vista Water Storage District (BVWSD). This document states that "the Sale Water is available upon completion of environmental review and facilities for the marketing program contemplated by this agreement." Appendix O2, Groundwater Model Documentation, was prepared by URS and is dated April 30, 2009. This URS report cites in its references two studies by Sierra Scientific Services addressing BVWSD water quality and the potential impacts of the district's proposed Brackish Groundwater Remediation Project. These studies are listed with 2009 dates and an indication that the studies are in preparation. In addition, page 5.14-14 of the project AFC states that the Brackish Groundwater Remediation Project is Component 4 of the district's Groundwater Management Plan, for which an EIR is currently under preparation.

Staff requests copies of the following studies, or most recent drafts of the studies, to help staff evaluate both the availability and the potential impacts associated with the HECA project's proposed water supply.

DATA REQUEST

102. Please provide a copy of the completed document, or most recent draft, of the following report: "A Baseline Water Quality Analysis of the Buena Vista Water Storage District", prepared by Sierra Scientific Services, Bakersfield, California, dated 2009.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

103. Please provide a copy of the completed document, or most recent draft, of the following report: "An Evaluation of the Geology, Hydrology, Well Placements and Potential Impacts of the Buena Vista Water Storage District's proposed Brackish Groundwater Remediation Project", prepared by Sierra Scientific Services, Bakersfield, California, dated 2009.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

104. Please provide copies of any available draft or final Environmental Impact Reports or other environmental documents or materials developed or in development for the BVWSD's Groundwater Management Plan and the associated Brackish Groundwater Remediation Project.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request. However, without waiving the objection, the BVWSD Draft Environmental Impact Report was recently made public and is included as Attachment 104-1 on CD-ROM.

ATTACHMENT 104-1

DATA REQUEST

105. Please provide updated information on the status of the BVWSD Groundwater Management Plan environmental review and approval. Please include updated information and schedule (if available) for approval and implementation of the district's Brackish Groundwater Remediation Project.

RESPONSE

The most up-to-date information that the Applicant has on the BVWSD Groundwater Management Plan is the draft Environmental Impact Report, as discussed in the response to Data Request 104.

BACKGROUND

The HECA Project proposes to use horizontal directional drilling (HDD) to install project linears (carbon dioxide, natural gas, and potable water pipelines) under the California Aqueduct, Kern River Flood Control Channel, and West Site/Outlet Canal, in order to minimize disturbance of and impacts to water courses and sensitive areas. While use of HDD helps minimize impacts in sensitive areas, one of the risks associated with HDD is the release of drilling mud into the environment due to spills, tunnel collapse, or fractures developed in the subsurface rock/soil from drilling pressures (known as a "frac-out"). Staff requires additional information on what steps the project will take to prevent frac-outs or other releases from project HDD activities.

DATA REQUEST

106. Please provide an appropriate frac-out contingency plan for project horizontal directional drilling (HDD) activities. (The level of detail for the plan should be equivalent to what would normally be required by a Department of Fish and Game Stream Bed Alteration agreement.)

RESPONSE

Per the Revised AFC, the depth of HDD under water bodies will comply with all applicable state and federal regulations (including CDFG). In addition, the clay soils have a low likelihood of causing frac-outs. If a frac-out occurred, the area would be restored and monitored (this would likely involve re-seeding and ensuring the vegetation would take hold).

Please see Attachment 106-1, frac-out plan. This plan has been used for major directional drills with the Southern California Gas Company, and the level of detail is consistent with CDFG requirements.

ATTACHMENT 106-1

BACKGROUND

Page 5.14-26 states that once hydrotesting is complete the test water will be discharged to upland areas, to canals, or returned to the source from which it was obtained. Discharges of wastewater (such as construction dewatering fluids and hydrotest waters) to surface waters, as well as discharges to land that threaten surface or groundwater, are activities regulated by the California Regional Water Quality Control Board, Central Valley Region (CVRWQCB). Staff needs additional information on the proposed hydrotest water discharge and how The Applicant plans to address CVRWQCB requirements for discharge of the hydrotest wastewaters.

DATA REQUEST

107. Please clarify whether or not the proposed discharge of project hydrotest wastewater will require authorization from the CVRWQCB, either in the form of compliance with the general National Pollutant Discharge Elimination System (NPDES) permit for low threat discharges (Order No. R5-2008-0081) or through issuance of an individual NPDES permit or waste discharge to land requirements.

RESPONSE

As stated in the responses to Data Requests 97 and 98, the source of the water to be used for hydrostatic testing of the pipelines will be potable water from WKWD. As summarized in Table 2-19 of the Revised AFC, the estimated quantity of this water is approximately 2.8 million gallons.

WKWD obtains its potable water from eight groundwater wells located within the Kern River groundwater basin, and supplements it with water from State Water Project water deliveries and agreements with various Kern County water agencies. The expected characteristics of the water to be supplied by WKWD were summarized in Table 5.14-6 of the Revised AFC.

The hydrostatic testing will be performed on new pipelines and no chemicals will be added to the test water. As such, the expected quality of the test water will be similar to the quality of the source water.

The Central Valley Regional Water Quality Control Board Resolution No. R5-2008-0182 waives WDRs and Reports of Waste Discharge (RWDs) for specific types of discharges that pose a low threat to the quality of waters of the state. The waiver covers discharge to land of hydrostatic test water when the discharges occur for no more than a few weeks. The waiver is only applicable when the source water for the hydrostatic test is local (i.e., the same or better quality than the underlying groundwater), and the only expected waste constituents in the test water discharge are picked up from the structure being tested (i.e., no chemicals are introduced).

If the duration of the discharge of the hydrostatic test water is more than a few weeks, then the HECA Project will comply with the General Order No. 2003-0003-DWQ, which includes low threat discharges to land from hydrostatic testing.

Alternatively, the hydrostatic test water could be discharged to one of the local canals in accordance with the General Order No. R5-2008-081, which includes low threat discharges to surface water from hydrostatic testing. This general permit allows discharges of up to four months in duration or up to 0.25 mgd.

DATA REQUEST

108. If the proposed discharge meets the conditions for the general NPDES permit, please submit to both the CVRWQCB and Energy Commission staff all the information necessary for preliminary completion of the Notice of Intent required for application and coverage under the general order.

RESPONSE

See Attachment 108-1 for the draft Notice of Intent (NOI) to comply with General Order No. 2003-0003-DWQ (to land) and Attachment 108-2 for the draft NOI to comply with General Order No. R5-2008-0081 (to surface water). Once the design and construction details have been developed and the quantity, duration, and method of discharge have been determined, the appropriate NOI will be prepared and submitted to the Central Valley Regional Water Quality Control Board, along with the appropriate fees, prior to the start of construction.

ATTACHMENT 108-1

ATTACHMENT 108-2

DATA REQUEST

109. If the proposed discharge does not meet the conditions for coverage under the general permit, but would still require authorization for discharge, please provide to both the CVRWQCB (with the appropriate filing fee) and Energy Commission staff all the information necessary for a Report of Waste Discharge as normally required by the CVRWQB for issuance of waste discharge requirements, but for the Energy Commission's in-lieu permitting authority.

RESPONSE

As explained in the responses to Data Requests 107 and 108, the Applicant does not anticipate a need for an individual RWD.

Technical Area: Waste Management
Author: Ellie Townsend-Hough

BACKGROUND

The Integrated Waste Management Act of 1989 (AB 939) established landfill waste diversion goals of 50 percent by the year 2000 for state and local jurisdictions. To meet the solid waste diversion goals, many local jurisdictions have implemented Construction and Demolition Waste Diversion Programs.

DATA REQUEST

110. Please indicate whether Kern County operates a Construction and Demolition Waste Diversion Program.

RESPONSE

Kern County does not have a requirement for a minimum quantity or percentage of construction/ demolition debris that must be diverted from a landfill, other than requiring that clean wood (excluding pressure-treated wood) and concrete (without rebar and without soil) be recycled.

As an incentive to recycle construction/demolition debris, the County's solid waste facility offers a discount of 50 percent off the tipping fee for wood and concrete. Each of these materials must be delivered to the County's solid waste facility in separate bins.

The Kern County Waste Management Department website provides a recycling brochure and a more-specific brochure for construction and demolition waste recycling options. The website link is http://www.co.kern.ca.us/wmd/Services/Recycle/recycle.html.

Table 5.13-1 of the Revised AFC lists Waste Recycling/Disposal Facilities. The brochures from the Kern County website list additional facilities, although some are restricted to residential recycling rather than commercial.

DATA REQUEST

111. Please provide information on how the HECA project will meet each of the requirements of the program cited in the previous data request.

RESPONSE

As discussed in Section 5.13.2.1 of the Revised AFC, a waste management plan will be prepared prior to construction. This plan will address segregation and recycling. Table 5.13-2 of the Revised AFC, Summary of Construction Waste Streams and Management Methods, summarizes the anticipated waste streams generated during construction, along with appropriate management methods for treatment, recycling, or disposal.

BACKGROUND

Staff reviews the capacity available at off-site treatment and disposal sites and determines whether or not the proposed power plant's waste would have a significant impact on the volume of waste a facility can accept. The California Integrated Waste Management Board provides guidance in their "Construction and Demolition and Inert Debris Tools and Resources Kit" which provides information on waste materials, densities, and methods for calculating waste volumes. This guidance can be found at http://www.ciwmb.ca.gov/leatraining/Resources/CDI/Tools/Calculations.htm.

Landfill capacities, in cubic yards, are identified in AFC section 5.13.1. Although Tables 5.13-1, and 5.13-2, provide information on the estimated quantities of wastes generated during construction and operation, they do not provide a total volume of waste that would be generated during construction and operation. Therefore, staff cannot compare the volume of waste associated with the HECA power plant with the remaining volumetric capacity at potential landfill disposal sites.

DATA REQUEST

112. Please provide information on the total volume of waste, in cubic yards, that will be generated during construction and operation.

RESPONSE

Applicant Clarification of Background: Tables 5.13-2 and 5.13-3 (and Tables 2-19 and 2-20) in the Revised AFC provide information on the estimated quantities of wastes generated during construction and operation. Table 5.13-1 in the Revised AFC presents disposal options and landfill capacities.

Tables 5.13-2 and 5.13-3 from the Revised AFC have been modified and are presented as Tables 112-1 and 112-2 on the following pages. These tables now present total volumes of solid waste in cubic yards. Tables 2-19 and 2-20 from the Project Description in the Revised AFC are revised by reference (those tables are identical to Tables 5.13-2 and 5.13-3).

In addition, during design development, the Applicant determined that no Sour Water Carbon Filter (activated carbon), methyldiethanol amine Sludge tail-gas treating unit, or Sour Water Sludge will be produced by the HECA Project. The attached Table 112-2 omits these deleted waste streams.

Table 112-1
(Revised Table 5.13-2 and 2-19)
Summary of Construction Waste Streams and Management Methods[1]

Waste Stream	Waste Classification	Anticipated Maximum Amount	Units	Disposal Method	Estimated Density (lb/CF)	Estimated Density (short tons/CY)	Volume (CY/year)[2]
Used Lube Oils, Flushing Oils	Hazardous	7	55-gallon drums per month	Recycle	NA	NA	NA
Hydrotest Water (One time per commissioning, reuse as practical, test for hazardous characteristics)	Hazardous or Nonhazardous	2,800,000	gallons total	Characterize. Drain nonhazardous to the Retention Basin. Dispose of hazardous at a hazardous waste treatment and disposal facility.	NA	NA	NA
Chemical Cleaning Wastes (Chelates, Mild Acids, TSP, and/or EDTA – During Commissioning)	Hazardous or Nonhazardous Recyclable	525,000	gallons total	Hazardous or nonhazardous waste treatment and disposal facility.	NA	NA	NA
Solvents, Used Oils, Paint, Adhesives, Oily Rags	Cal-Hazardous Recyclable	160	gallons per month	Recycle or hazardous waste treatment and disposal facility.	NA	NA	NA
Spent Welding Materials	Hazardous	260	pounds per month	Dispose at a hazardous waste landfill.	200	2.7	0.6
Used Oil Filters	Hazardous	100	pounds per month	Dispose at a hazardous waste landfill.	50	0.68	0.9
Fluorescent/Mercury Vapor Lamps	Hazardous Recyclable	50	units per year	Recycle	NA	NA	NA
Misc. Oily Rags, Oil Absorbent	Nonhazardous or Hazardous Recyclable	1	55-gallon drum per month	Recycle or dispose at a hazardous waste landfill.	NA	NA	3.3
Empty Hazardous Material Containers	Hazardous Recyclable	1	cubic yard per week	Recondition, recycle, or dispose at a hazardous waste landfill.	NA	NA	52

Table 112-1
(Revised Table 5.13-2 and 2-19)
Summary of Construction Waste Streams and Management Methods[1]

Waste Stream	Waste Classification	Anticipated Maximum Amount	Units	Disposal Method	Estimated Density (lb/CF)	Estimated Density (short tons/CY)	Volume (CY/year)[2]
Used Lead/Acid and Alkaline Batteries	Hazardous Recyclable	1	ton per year	Recycle	NA	NA	NA
Sanitary Waste from Workforce (Portable Chemical Toilets)	Nonhazardous	390	gallons per day	Pump and dispose by sanitary waste contractor.	NA	NA	NA
Site Clearing – Grubbing, Excavation of Non-Suitable Soils, Misc. Debris	Nonhazardous	Minimal	NA	Reuse Soils or dispose at a nonhazardous waste landfill (see Section 2.6.1 — Project Site Construction — of this Revised AFC).	NA	NA	NA
Scrap Materials, Debris, Trash (Wood, Metal, Plastic, Paper, Packing, Office Waste, etc.)	Nonhazardous	40	cubic yards per week	Recycle or dispose at a nonhazardous waste landfill.	NA	NA	2,080
					Total Annual Cubic Yards:		**2,137**

Source: HECA Project.

Notes:
[1] All Numbers are estimates.
[2] Volumetric quantities shown for wastes expected to be disposed in nonhazardous or hazardous waste landfills. Volumetric quantities are not shown for wastes that are expected to be recycled or treated and disposed by means other than landfill.
CF = cubic feet
CTG = combustion turbine generator
CY = cubic yards
EDTA = ethylene diamine tetra-acetic acid
lb = pounds
NA = Not Applicable (due to waste not being landfilled)
STG = steam turbine generator
TSP = trisodium phosphate

Table 112-2
(Revised Table 5.13-3 and 2-20)
Summary of Operating Waste Streams and Management Methods[1]

Waste Stream	Waste Classification	Anticipated Maximum Amount / year	Units	Disposal Method	Density (lb/CF)	Density (short tons/CY)	Volume (CY/year)[2]
Spent Claus Sulfur Recovery Catalyst (Activated Alumina)	Nonhazardous	7	tons	Dispose at a nonhazardous waste landfill.	44.0	0.594	12
Claus Catalyst Support Balls (Activated Alumina)	Nonhazardous	3	tons	Recycle	91.0	1.229	2
Spent Sour Shift Catalyst (Cobalt Molybdenum)	Nonhazardous	67	tons	Send to reclaimer for metals recovery.	40.6	0.548	122
Spent Titania (TiO_2)	Nonhazardous	2	tons	Dispose at a nonhazardous waste landfill.	77.0	1.040	2
Spent Hydrogenation Catalyst (Cobalt Molybdenum)	Nonhazardous	2	tons	Send to reclaimer for metals recovery.	40.6	0.548	4
Hydrogenation Catalyst Support Balls (Alumina Silicate)	Nonhazardous	1	ton	Recycle	91.0	1.229	1
Spent SCR Catalyst (Titanium, vanadium, tungsten, combustion contaminants, and inert ceramics)	Hazardous	1,600	cuft	Return to supplier to reclaim/dispose.	NA	NA	NA
Spent CO/VOC oxidation catalyst (Noble metals, other inerts, and combustion contaminants)	Nonhazardous	600	cuft	Send to reclaimer for noble metals recovery.	NA	NA	NA
Amine Regenerator Carbon Filter TGTU (Activated Carbon)	Hazardous	26	tons	Stabilize and dispose at a hazardous waste landfill.	77.0	1.040	25

Table 112-2
(Revised Table 5.13-3 and 2-20)
Summary of Operating Waste Streams and Management Methods[1]

Waste Stream	Waste Classification	Anticipated Maximum Amount / year	Units	Disposal Method	Density (lb/CF)	Density (short tons/CY)	Volume (CY/year)[2]
Spent Mercury Removal Carbon Beds (Impregnated activated carbon)	Hazardous	14	tons	Stabilize and dispose at a hazardous waste landfill.	35.6	0.481	29
Process Wastewater ZLD Solids (Inorganic and organic salts)	May be Nonhazardous or Hazardous	5,300	tons	Stabilize and dispose at a hazardous waste landfill	71.7	0.968	5,475
Plant Wastewater ZLD Solids (Inorganic and organic salts)	Anticipated Nonhazardous	15,000	tons	Stabilize and Characterize for landfill disposal.	78.2	1.056	14,209
Refractory Brick and Insulation	Anticipated Nonhazardous	360	tons	Characterize for landfill disposal.	160.0	2.160	167
Amine Absorber Residues TGTU (Iron and salts)	Nonhazardous	20	cuyd	Dispose at a nonhazardous waste landfill.	NA	NA	20
Spent Caustic	Hazardous	400,000	gal	Offsite treatment to oxidize sulfides to sulfates. Adjust pH and dispose as nonhazardous.	NA	NA	NA
Spent Sulfuric Acid	Hazardous	14,000	gal	Dispose of at hazardous waste treatment and disposal facility.	NA	NA	NA
Off-Line Combustion Turbine Wash Wastes (Detergents and residues)	Hazardous or Nonhazardous	15,000	gal	Characterize and dispose as nonhazardous or treat and dispose as hazardous waste.	NA	NA	NA

Table 112-2
(Revised Table 5.13-3 and 2-20)
Summary of Operating Waste Streams and Management Methods[1]

Waste Stream	Waste Classification	Anticipated Maximum Amount / year	Units	Disposal Method	Density (lb/CF)	Density (short tons/CY)	Volume (CY/year)[2]
HRSG Wash Water (Infrequent) (Detergent, residues, neutralized acids)	Hazardous or Nonhazardous	100,000	gal	Characterize and dispose as nonhazardous or treat and dispose as hazardous waste	NA	NA	NA
Water Treatment Sludge and Used Water Filter Media	Nonhazardous	90	ton	Characterize and dispose as nonhazardous or hazardous waste.	40.0	0.540	167
Used Oil	Hazardous	8,000	gal	Recycle.	NA	NA	NA
Spent Grease	Hazardous	16	55-gallon drums	Characterize and dispose as hazardous waste.	NA	NA	NA
Miscellaneous Filters and Cartridges	Hazardous or Nonhazardous	150	cuyd	Characterize and dispose as nonhazardous or hazardous waste.	NA	NA	150
Miscellaneous Solvents	Hazardous	2	55-gallon drums	Recycle or treatment and disposal as hazardous waste.	NA	NA	NA
Flammable Lab Waste	Hazardous	2	55-gallon drums	Characterize and recycle or treat and dispose as hazardous waste.	NA	NA	NA
Waste Paper and Cardboard	Nonhazardous	320	cuft	Recycle	NA	NA	NA
Combined Industrial Waste (Used PPE, materials, small amounts of refractory, slurry debris, etc.)	Nonhazardous	320	cuft	Dispose at a nonhazardous waste landfill.	NA	NA	12

Table 112-2
(Revised Table 5.13-3 and 2-20)
Summary of Operating Waste Streams and Management Methods[1]

Waste Stream	Waste Classification	Anticipated Maximum Amount / year	Units	Disposal Method	Density (lb/CF)	Density (short tons/CY)	Volume (CY/year)[2]
Normal Rate Gasification solids (Solid slag-like product)	Anticipated to be Nonhazardous or covered by regulatory exclusion	51,000	tons	Reuse, reclaim sellable metals, or characterize for landfill disposal in accordance with applicable LORS.	125.0	1.688	30,222
Maximum Rate Gasification solids (Solid slag-like product)	Anticipated to be Nonhazardous or covered by regulatory exclusion	274,000	tons	Reuse, reclaim sellable metals, or characterize for landfill disposal in accordance with applicable LORS.	82.5	1.114	246,016
				Total Cubic Yards w/o Gasifier Solids			**20,396**

Source: HECA Project

Notes:

[1] All numbers are estimates.

[2] Volumetric quantities shown for wastes expected to be disposed in nonhazardous or hazardous waste landfills. Volumetric quantities are not shown for wastes that are expected to be recycled or treated and disposed by means other than landfill.

CO = carbon monoxide
HRSG = heat recovery steam generator
PPE = personal protective equipment
SCR = selective catalytic reduction
TiO_2 = Titania
TGTU = tail gas treating unit
VOC = volatile organic compounds
ZLD = zero liquid discharge

BACKGROUND

Table 5.13-3 of the AFC provides information on the operation wastes expected to be generated by the project and briefly describes onsite and offsite management methods for the wastes. "Dispose at an incinerator" is listed as an onsite management method, however, no additional information explaining this management method is provided.

DATA REQUEST

113. A. For the methyldiethanol amine sludge from tail-gas treating unit (MDEA Sludge TGTU) and sour water sludge waste stream in Table 5.13-3 where the onsite management method is identified as "dispose at an incinerator", please explain what facilities will be used as a management method.

B. Provide more on how the wastes will be managed onsite (i.e., how the waste will be stored or accumulated, and/or transported off-site).

RESPONSE

A. As discussed in the response to Data Request 112, the Applicant has determined that no methyldiethanol amine sludge TGTU or sour water sludge will be produced by the HECA Project. A revision to Table 5.13-3 from the Revised AFC is presented in the response to Data Request 112.

B. Because these sludges will not be produced by the HECA Project, the request for information about onsite management is no longer applicable.

BACKGROUND

The HECA project proposes to recycle both non-hazardous and hazardous wastes as much as possible and also proposes to implement a waste minimization program. Staff fully supports these efforts. Table 5.13-3 shows that as much as 274,000 tons per year of gasification solids waste could be generated. The applicant has provided no information on the location of on-site storage of gasification solids, transportation off-site, and the evaluation process for reuse of gasification solids (Page 5.13-12).

DATA REQUEST

114. Please provide a description of the process that will be used to evaluate and determine how the gasification solids will be reused or recycled.

RESPONSE

There are multiple offsite applications that are being considered for the reuse/recycling of the gasification solids. A brief description of these applications for the gasification solids is presented in response to Data Request 29.

The HECA Project will test the gasification solids to determine satisfaction of the specifications required by the potential user. The specific disposition of the gasification solids will be based on the product specifications and customer demand. As described in response to Data Request 29, potential gasification solids recipients are identified below by the types of industry:

1. Ready-mix Concrete
2. Cement manufacturing
3. Aggregate application
4. Portland Cement Concrete/road base/flowable fill
5. Sand-blasting application.

For each application identified, the HECA Project has identified a list of potential candidates. The Applicant will be diligently working to further identify the feasibility of the foregoing and future options for reuse or recycling of the gasification solids.

DATA REQUEST

115. Please provide a summary table of information on proposed businesses that would purchase gasification solids from the project. At a minimum, please include the following information for each facility: facility location, distance from project site, frequency and method of delivery, capacity, materials accepted, acceptance limits (if any), volume they would purchase or accept, and terms of agreement under which they would purchase or accept gasification solids from the project.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request. Without waiving its objections, the Applicant provides the following response to Data Request 115.

The Applicant has used a third party to contact a number of businesses that could potentially use the gasification solids from the HECA Project as a raw material feedstock for their products. (See the response to Data Request 29 for details on potential reuse and recycle purposes.) The expected physical and chemical composition of the gasification solids was reviewed by the potential businesses. The Applicant based this information on process design parameters and the actual composition of gasification solids obtained from comparable plants. The businesses expressed interest in the properties and quantities, but indicated that they would need to see the actual material and either test it or review the Applicant's analytical results before progressing discussions to a commercial basis that would include quantitative and qualitative contract specifications and parameters.

Table 115-1, which identifies the businesses contacted, is being submitted under separate confidential cover.

DATA REQUEST

116. Please describe where and how the gasification solids will be stored prior to reuse or disposal. Please describe the location, size, containment, and any regulatory permits required.

RESPONSE

The Applicant's response to Data Request 114 explains that the gasification solids are dewatered, carbon is recovered for onsite recycling, and the remaining solids are accumulated for offsite disposal. Upon exiting the gasifier, the liquids and carbon are recovered and returned to the slurry preparation area for reuse. The remaining dried gasification solids will be retained in onsite storage bins or containers until sufficient quantities are accumulated to facilitate their economical transportation to the designated offsite location.

As presented in responses to Data Requests 28 and 29, the Applicant has studied beneficial use of gasification solids for reuse or recycling for cement production, aggregate concrete mixing, and other purposes. As a product, nonhazardous or hazardous waste permits will not be required. The Applicant will comply with all applicable laws, ordinances, regulations, and standards in connection with its gasification solid handling and accumulation prior to reuse/ recycle.

BACKGROUND

The Phase I Environmental Site Assessment (Phase I ESA) prepared in accordance with ASTM Standard E 1527-05 guidelines by URS Corporation for the proposed HECA project (Appendix M, Volume II of the project Application for Certification (AFC)) provides information on the main Project Site but does not address the areas associated with linear facilities to be constructed as part of the project.

The applicant is proposing an 8-mile long transmission line, 8-mile long natural gas pipeline, 7-mile long water line and a 4-mile long carbon dioxide pipeline. A Phase I ESA, or equivalent information, is needed for the properties along linear facilities to determine if past or present uses of the property have caused, or threaten to cause, contamination that might impact, or be impacted by, construction and operation of the proposed project.

DATA REQUEST

117. Please provide a Phase I ESA, or equivalent information, addressing the past and present uses of property along, adjacent to, or in proximity of the project's transmission line, natural-gas pipeline, water line, and carbon dioxide pipeline. The requested information should include an evaluation addressing whether or not past or present site conditions may have resulted in contamination or potential contamination that could impact construction and/or operation of the proposed project.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

118. Where the alignments traverse properties where there has been agricultural land use, the Phase I ESA shall identify the type of crops grown over as long a period as records indicate, the historical use and identity of pesticides (including organic and inorganic pesticides, and herbicides), and a statement of the likelihood of finding levels of pesticides along the pipeline/transmission routes that might present a risk to workers and/or the public.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

BACKGROUND

The Phase I Environmental Site Assessment (ESA) identified recognized environmental conditions (RECs) at the site which establishes the need for the applicant to complete and submit a Phase II to evaluate whether they present a significant health and safety risk. The RECs included staining on the ground surface, underground fuel oil storage tanks, and contaminated soil. In addition, there is an unidentified liquid discharge, and an uncontained tailings pile associated with the operation of the Port Organics Products, LTD (PO) natural fertilizer manufacturing plant located on a portion of the proposed site. The presence of these conditions establishes the need for the applicant to complete and submit a Phase II ESA to staff.

The historical use of the proposed project site was agricultural, which suggests that pesticides and herbicides were likely used on the site. Common agricultural practices can result in residual concentrations of fertilizers, pesticides or herbicides in near-surface soil. The Phase I ESA did not identify this land use as a REC. To ensure that the concentrations of agricultural chemicals do not pose a potential health risk or hazard, the applicant should provide soil sampling and characterization of the parcel/Project Site. The California Department of Toxic Substances Control (DTSC) has prepared the "Interim Guidance for Sampling Agricultural Fields for School Sites (Second Revision August 26, 2002)". Staff believes this guidance or equivalent may be appropriate for further site analysis.

DATA REQUEST

119. Please provide results of field sampling and analysis which adequately characterize the presence of harmful chemicals or conditions at the site if any, and identify whether there will be any risk to construction or plant personnel due to the presence of these chemicals.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

120. Please confirm that there is no site contamination related to underground storage tanks located on the proposed project site.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

121. Please provide an estimated date for the demolition of the fuel oil tanks on the proposed project site, along with a schedule and work plan for investigation and possible remediation of soils in the vicinity of the tanks.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

122. Please identify what constituents are in the PO fertilizer plant's contaminated soil and tailing piles located on the proposed project site.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

123. Please provide a schedule and work plan for investigation and possible remediation of soils and tailing piles that may pose a health and safety risk.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

DATA REQUEST

124. Please provide information on any soil sampling and analysis or regulatory enforcement action that may have been taken related to the discharge pictured in Photo 21 of the Phase 1 ESA or other discharges related to the PO operation.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant objects to this data request.

Technical Area: Visual Resources – Visible Plume
Author: William Walters

BACKGROUND

Staff needs additional information to review the applicant's visible plume modeling analysis for the CTG/HRSG. Staff requires additional CTG/HRSG exhaust information to confirm the modeling inputs used in the applicant's analysis and complete this review.

DATA REQUEST

125. Please summarize for the gas turbine/HRSGs the exhaust conditions to complete or correct data in the table below.

Parameter	***CTG/HRSG Exhaust***					
Stack Height*	***65 meters (213 feet)***					
Stack Diameter*	***6.1 meters (20 feet)***					
Ambient Temperature*	***30°F***		***65°F***		***100°F***	
	Non-Duct Fired					
Fuel Type	***H_2-Rich***	***Nat Gas***	***H_2-Rich***	***Nat Gas***	***H_2-Rich***	***Nat Gas***
Full Load Exhaust Temperature (°F)						
Full Load Exhaust Flow Rate (1000 lbs/hr)						
Full Load Exhaust Moisture Content (wt %)						
	Duct Fired					
Fuel Type	***H_2-Rich***	***Nat Gas***	***H_2-Rich***	***Nat Gas***	***H_2-Rich***	***Nat Gas***
Full Load Exhaust Temperature (°F)						
Full Load Exhaust Flow Rate (1000 lbs/hr)						
Full Load Exhaust Moisture Content (wt %)						

**** Stack height and diameter are from Appendix D of the AFC. Limited exhaust data is available for Appendix D but does not provide the ambient conditions assumed.***

Different cold weather, average annual, and hot weather temperature conditions can be provided as available.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BACKGROUND

Staff plans to perform a plume modeling analysis for the cooling tower and review the applicant's visible plume modeling analysis. Staff requires additional cooling tower operating information to complete this analysis.

DATA REQUEST

126. Please summarize for the main power block/gas cooling tower the conditions that affect vapor plume formation including cooling tower heat rejection, exhaust temperature, and exhaust mass flow rate. Please provide values to complete the table, and additional data as necessary for staff to be able to determine how the heat rejection load varies with ambient conditions and also determine at what ambient conditions cooling tower cells may be shut down.

Parameter	***Main Power Block/Gas Cooling Tower Exhausts***					
Number of Cells	***17 cells (1 by 17)***					
Cell Height*	***16.76 meters (55 feet)***					
Cell Diameter*	***9.14 meters (30 feet)***					
Tower Housing Length*	***259.20 meters (850 feet)***					
Tower Housing Width*	***18.29 meters (60 feet)***					
Ambient Temperature*	***30°F***		***65°F***		***100°F***	
Ambient Relative Humidity	***90%***		***40%***		***15%***	
Duct Firing	***Yes***	***No***	***Yes***	***No***	***Yes***	***No***
Number of Cells in Operation						
Heat Rejection (MW/hr)						
Exhaust Temperature (°F)						
Exhaust Flow Rate (lb/hr)						

****Cell height and diameter and tower length and width are from air quality modeling files, where the tower height is somewhat different than the value given in the SACTI visible plume modeling files.***

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

127. Additional combinations of temperature and relative humidity, if provided by the applicant, will be used to more accurately represent the cooling tower exhaust conditions. Please include appropriate design safety margins for the heat rejection, exhaust flow rate and exhaust temperature in consideration that the air flow per heat rejection ratio is often used as Condition of Certification confirmation of design limit.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

128. Please summarize for the main power block/gas cooling tower the conditions that affect vapor plume formation including cooling tower heat rejection, exhaust temperature, and exhaust mass flow rate. Please provide values to complete the table, and additional data as necessary for staff to be able to determine how the heat rejection load varies with ambient conditions and also determine at what ambient conditions cooling tower cells may be shut down.

Parameter	***ASU Cooling Tower Exhausts***		
Number of Cells	***4 cells (1 by 4)***		
Cell Height*	***16.76 meters (55 feet)***		
Cell Diameter*	***9.14 meters (30 feet)***		
Tower Housing Length*	***60.70 meters (199 feet)***		
Tower Housing Width*	***18.29 meters (60 feet)***		
Ambient Temperature*	***30°F***	***65°F***	***100°F***
Ambient Relative Humidity	***90%***	***40%***	***15%***
Number of Cells in Operation			
Heat Rejection (MW/hr)			
Exhaust Temperature (°F)			
Exhaust Flow Rate (lb/hr)			

Cell height and diameter and tower length and width are from air quality modeling files, where the tower height is somewhat different than the value given in the SACTI visible plume modeling files.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

129. Additional combinations of temperature and relative humidity, if provided by the applicant, will be used to more accurately represent the cooling tower exhaust conditions. Please include appropriate design safety margins for the heat rejection, exhaust flow rate and exhaust temperature in consideration that the air flow per heat rejection ratio is often used as Condition of Certification confirmation of design limit.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

130. Staff is concerned that the very high air flow rates per heat rejection values provided in the applicant's SACTI modeling files will be difficult to meet if they are required as a design condition. Please review the air flow rate and heat rejection data and confirm that following values used in the SACTI modeling are correct.

A. Main Power Block/Gas Cooling Tower – 27.8 kg/s air flow per MWh of cooling

B. ASU Cooling Tower – 30.9 kg/s air flow per MWh of cooling.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

131. Please provide the cooling tower manufacturer and model number information and a fogging frequency curve from the cooling tower vendor for the two cooling towers, if available.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

DATA REQUEST

132. Please identify if the cooling tower fan motors will be dual speed or have variable speed/flow controllers for either of the two cooling towers.

RESPONSE

As described in *Applicant's Requests for Extensions of Time and Objections to Certain Data Requests by the Energy Commission Staff regarding Data Request Set One (Nos. 1-132)*, docketed on November 2, 2009, the Applicant is requesting additional time to address this data request.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE *HYDROGEN ENERGY CALIFORNIA PROJECT*

Docket No. 08-AFC-8

PROOF OF SERVICE LIST
(Rev. 9/3/09)

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DECLARATION OF SERVICE

I, Dale Shileikis, declare that on November 11, 2009, I served and filed copies of the attached ***Responses to CEC Data Requests Set One (#1-132)***, dated November 2009. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[www.energy.ca.gov/sitingcases/hydrogen_energy]**.

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

_______ sent electronically to all email addresses on the Proof of Service list

___X___ by personal delivery or by depositing in the United States mail at San Francisco, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

_______ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

___X___ depositing in the mail an original as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-8
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512

docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Dale Shileikis
____