Data Request 91:

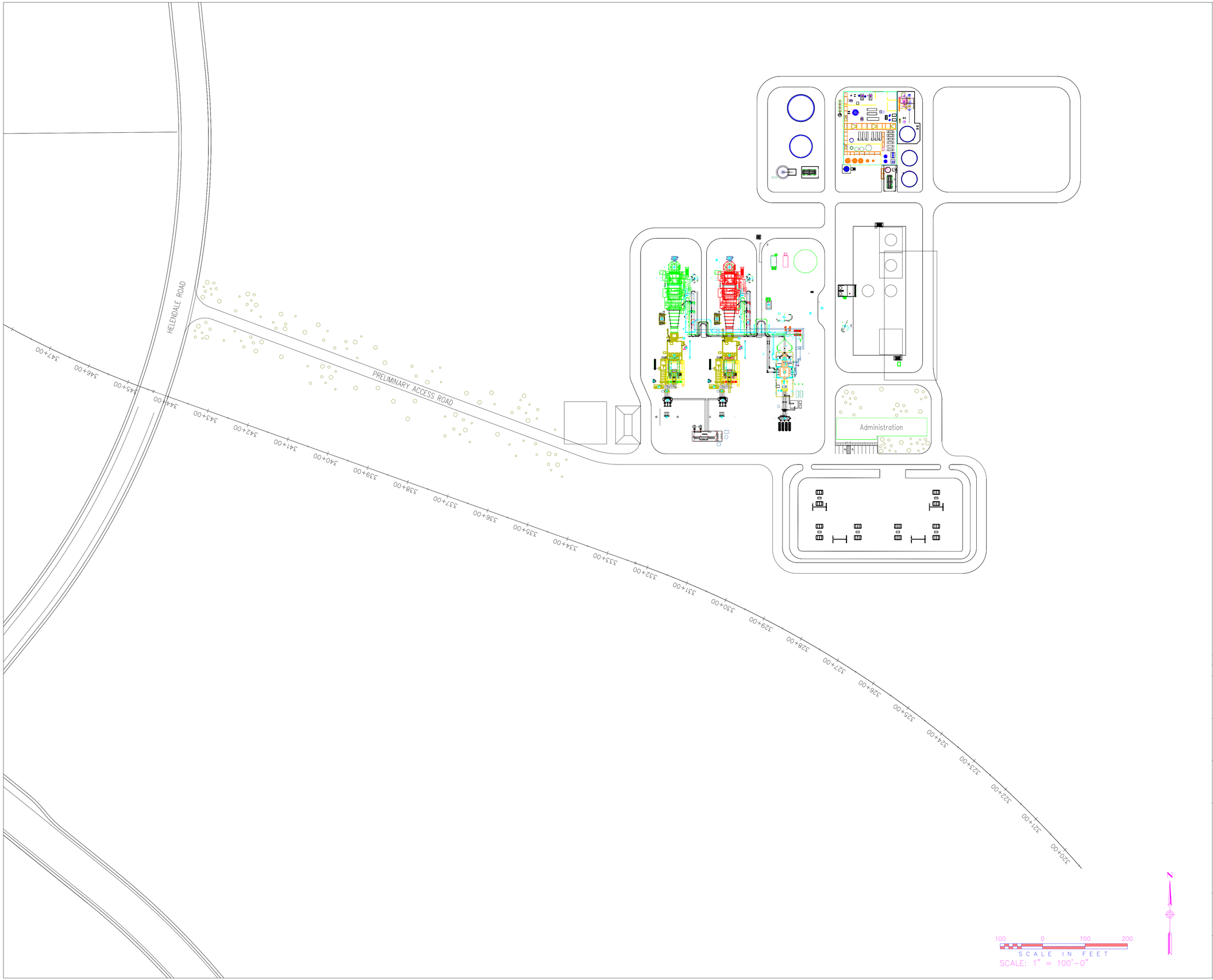
Please provide a conceptual landscape and irrigation plan that contains all the components required by the City.

Response:

Figure DR91-1 is a conceptual landscape plan for the VV2 Project site. (A larger format [24" x 36"] drawing of the plan is provided on the attached CD.) To ensure that the plan would be consistent with City requirements, the applicable City ordinances were reviewed and the City of Victorville Planning Department staff was consulted. City Planning staff indicated that landscaping utilizing only drought-tolerant landscaping is most appropriate for the industrial VV2 Project site (personal communication, Jon Roberts, Associate Planner, City of Victorville, July 16, 2007). He indicated further that there are no specific requirements for landscaping or fencing along Helendale Road (the Project site's western boundary) and that it would be appropriate to install plain chain link security fencing along the site perimeter with no additional landscaping.

Mr. Roberts concurred with the proposed landscaping concept of naturalistically-placed Joshua tree stands (only multi-sized Joshua trees and desert earth) at the plant site entry (intersection with Helendale Road), along the entry road into the site, at the onsite parking area for the administration building, and around the administration building itself. The landscape concept plan shows locations for approximately 150 Joshua trees; these Joshua trees would be transplanted from their current locations on the Project site to new locations along the perimeter.

Figure DR91-1. Conceptual Landscape Plan



Notes:

Joshua trees to be transplanted per requirements of the City of Victorville Community Services Department.

Joshua trees located on this plan by three relative sizes.

- Larger
- Medium
- Smaller

Number of trees on this plan – 150

– PRELIMINARY –
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DWN	CHK	APP	DATE
A	ISSUED FOR REVIEW	MTW	**	**	OPEN

KIEWIT INDUSTRIAL CO.
A Kiewit Company

INLAND ENERGY

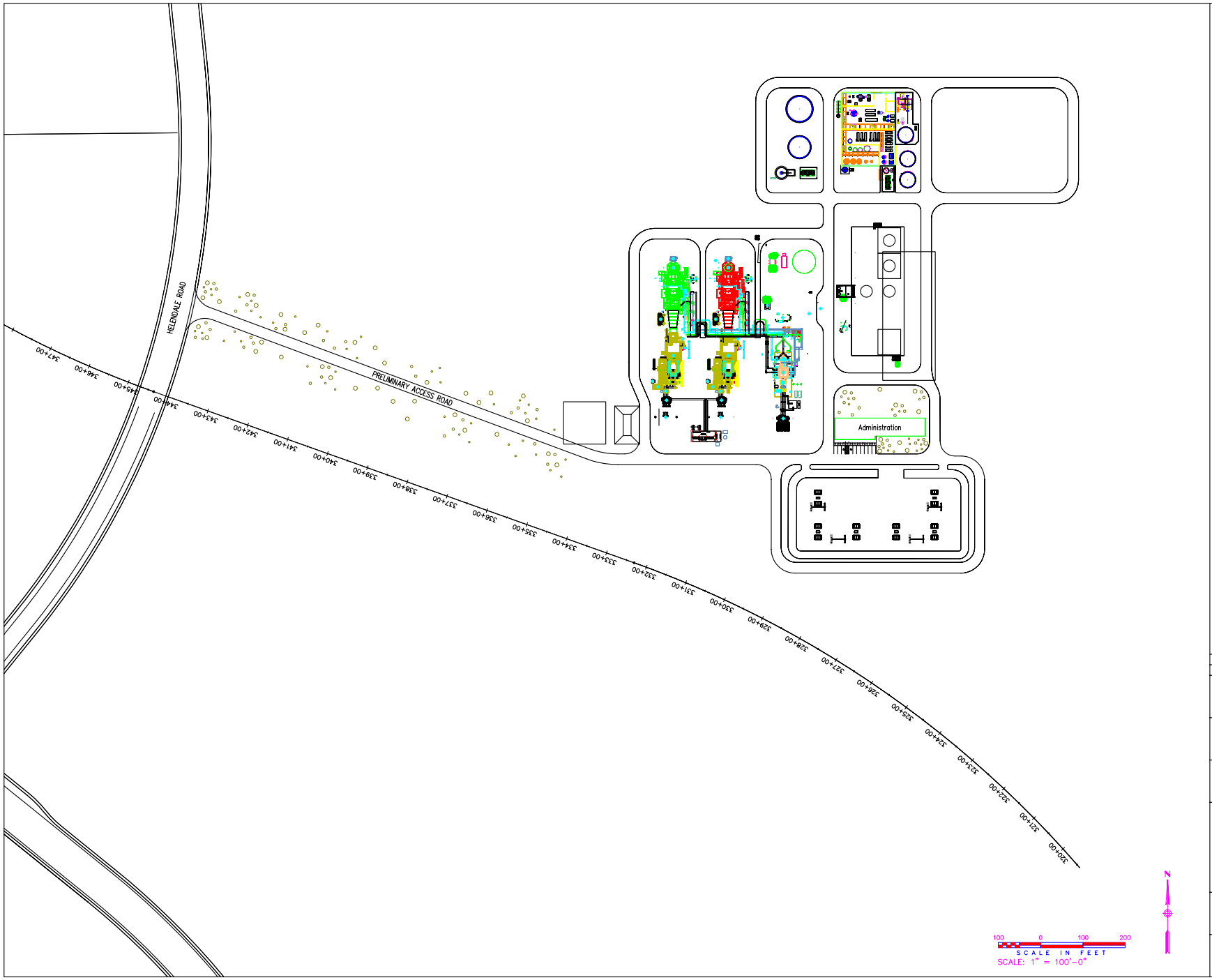
VICTORVILLE COMBINED CYCLE
POWER PROJECT

Bibb and associates
8455 Lenexa Drive
Lenexa, Kansas 66214

Conceptual Landscape Plan

	by	date
DESIGNED	ROO	03-29-07
DRAWN		
CHECKED		
APPROVED		

DRAWING NUMBER
SKC-2005038-CG-032907-1



Notes:

Joshua trees to be transplanted per requirements of the City of Victorville Community Services Department.

Joshua trees located on this plan by three relative sizes.

- Larger
- Medium
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Number of trees on this plan – 150

– PRELIMINARY –
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DRAWN		
CHECKED		
APPROVED		

DRAWING NUMBER
SKC-2005038-CG-032907-1

Data Request 92:

While 2,000 hours of duct firing is specified in Appendix G.4, it is unclear when duct firing will be used. Please describe how natural gas duct firing is planned to be used considering the variability of solar generation and address whether:

a. Duct firing will be used as a supplement when solar is not at full capacity; and/or

b. The steam turbine capacity is such that duct firing can also be used for peaking power regardless of solar output.

Response:

a. In general terms the duct burners will be operated as follows:

- When the electrical demand exceeds the available solar and base load plant capacity, duct firing will be used to supplement the solar to meet the demand up to the maximum plant output.
- If the electrical demand is within the available solar and plant base load capacity, 100 percent of the available solar will be used and the combined-cycle load will be adjusted to match the demand. Duct firing will not be used.
- If there is no solar available (nighttime or the solar field is undergoing maintenance/repair), and the electrical demand exceeds the base load plant capacity, duct firing will be used to meet the demand up to the maximum plant output.
- If there is no solar available (nighttime or the solar field is undergoing maintenance/repair), and the electrical demand is within the base load plant capacity, duct firing will not be used.

b. To an extent, duct firing can be used for peaking power regardless of solar output. The steam turbine is sized for two CTG/HRSG trains in base load operation with both units at 100 percent duct fire and no solar input. The solar input is approximately 50 percent of the collective 100 percent fired input of both units. When full solar is available, only approximately 50 percent of the duct burner capacity is available with both CTGs operating at base load. If the plant is operating only one CTG/HRSG at base load, the system is still capable of using 100 percent of the solar input. In this case, duct firing will not be available.

Data Request 93:

Please describe what time of day and time of year the duct burners would be most likely to operate.

Response:

Duct burners would be most likely to operate during peak power demand hours of the day, when the demand exceeds the base load-plus-solar capacity of the VV2 Project. In general, it is likely to be summer daytime hours when the electrical demand requires maximum output. Duct burner use also may be required during the summer late afternoon and evening periods when demand remains high but the solar input is in decline. Duct burner use may also occur during winter nighttime hours when the electrical demand may exceed the plant base load capacity and solar is unavailable.

Data Request 94:

Please provide the exhaust water content (in volume fraction or weight fraction) or water content flow rate (lbs/hour) out of the gas turbine/HRSG stacks for the following operating cases 1-3, 6-8, 11-13, 16-18, 21-23, and 26-28 shown in Appendix G.4.

Response:

The requested exhaust water content data are provided in the following table:

Operating Case	Stack Exhaust Water Content, (% Volume)
1	7.52
2	8.62
3	9.12
6	9.22
7	10.41
8	10.94
11	8.38
12	9.52
13	10.03
16	7.52
17	8.62
18	9.12
21	8.38

Operating Case	Stack Exhaust Water Content, (% Volume)
22	9.52
23	10.03
26	7.95
27	9.07
28	9.58

Data Request 95:

In reference to Appendix G.4, Table G.4-2, please describe why the duct firing basis for the one-turbine operating cases (21 to 30) have half of the heat input as the two-turbine operating cases (6 to 15) when the table indicates the heat input values are for each duct burner.

Response:

HRSG manufacturers require a lower duct burner heat input when operating in a 1x1 mode, usually 50 percent or less of the "rated" duct burner heat input in a 2x2 mode. This requirement is caused by changes in the gas temperature profile in the HRSG when the main steam pressure changes. Firing is reduced in order to not exceed tube wall material maximum temperature limitations in the superheater and reheater sections downstream of the duct burner.

Data Request 96:

Please provide the AERMOD and VIZDET input/output files, including meteorological data and relative humidity files, used to provide the information on gas turbine/HRSG plumes cited in Section 6.13 and 6.15 of the AFC.

Response:

The AERMOD and VIZDET input/output files are provided on the enclosed CD (see Attachment 96-1). The meteorological data file input to VIZDET is the "SURFACE" meteorological data file produced by AERMET for input to AERMOD. The "SURFACE" file contains relative humidity data from the National Weather Service (NWS) station at General Williams J. Fox Field in Lancaster, CA.

Data Request 97:

Please provide an electronic copy of the VIZDET model, a brief description of how to operate the model, and an electronic copy of the model's Fortran program code.

Response:

The VIZDET model executable file and Fortran program code are provided on the enclosed CD (see Attachment 97-1). A "readme" file is also provided on the CD that provides a brief description of how to operate the model. ENSR considers the VIZDET model to be proprietary, and it is provided for evaluation purposes only.

Data Request 98:

Please provide, if available, present weather, cloud cover and visibility data to match the other meteorological data used in the visible plume modeling analysis in Section 6.13.

Response:

Three years (2002-2004) of CD144 format data (a common National Climatic Data Center format) from the National Weather Service (NWS) station at General Williams J. Fox Field in Lancaster, CA were used for the analyses (see Attachment 98-1). These data contain present weather and cloud cover. Visibility data are not available in this dataset.

Data Request 99:

Please describe the daily profile and the seasonal heat rejection profile for the cooling tower.

Response:

From the standpoint of visible plume considerations, the least favorable operating profiles would be when the plant is operating at full duct fire when solar is not available, and when the plant is operating at full solar with supplementary duct firing when solar is available. The fired and solar heat rejection profiles are shown in the table provided in the response to Data Request 100a.

Plant operation will follow the ambient temperature. The 2006 temperature profile for the VV2 Project site is described in the following tables, based on data from the nearby SCLA:

Distribution of Temperature Data at SCLA from 1/1/06 to 12/31/06:

	Below 59°F	59°F to 77°F	Above 77°F	Max Value	Min Value
Daytime Maximum Temperature	12.9%	35.9%	52.2%	111 °F	44 °F
Daily Mean Temperature	40.8%	26.6%	32.6%	99 °F	34 °F
Nighttime Minimum Temperature	66.0%	29.0%	5.0%	93 °F	19 °F

Distribution of Temperature Data at SCLA from 1/1/06 to 3/31/06:

	Below 59°F	59°F to 77°F	Above 77°F	Max Value	Min Value
Daytime Maximum Temperature	28.9%	68.9%	2.2%	78 °F	48 °F
Daily Mean Temperature	93.3%	6.7%	0.0%	67 °F	38 °F
Nighttime Minimum Temperature	100%	0.0%	0.0%	55 °F	21 °F

Distribution of Temperature Data at SCLA from 4/1/06 to 6/30/06:

	Below 59°F	59°F to 77°F	Above 77°F	Max Value	Min Value
Daytime Maximum Temperature	1.1%	28.6%	70.3%	109 °F	53 °F
Daily Mean Temperature	19.8%	35.2%	45.0%	98 °F	46 °F
Nighttime Minimum Temperature	47.2%	47.4%	5.4%	89 °F	35 °F

Distribution of Temperature Data at SCLA from 7/1/06 to 9/30/06:

	Below 59°F	59°F to 77°F	Above 77°F	Max Value	Min Value
Daytime Maximum Temperature	0.0%	1.1%	98.9%	111 °F	77 °F
Daily Mean Temperature	0.0%	13.2%	86.8%	99 °F	62 °F
Nighttime Minimum Temperature	13.2%	65.9%	20.9%	93 °F	46 °F

Distribution of Temperature Data at SCLA from 10/1/06 to 12/31/06:

	Below 59°F	59°F to 77°F	Above 77°F	Max Value	Min Value
Daytime Maximum Temperature	21.5%	45.2%	33.3%	91 °F	44 °F
Daily Mean Temperature	50.5%	48.4%	1.1%	80 °F	34 °F
Nighttime Minimum Temperature	96.8%	3.2%	0.0%	69 °F	19 °F

Data Request 100:

For the cooling tower, please summarize the conditions that affect vapor plume formation as follows:

a. Cooling tower heat rejection, exhaust temperature, and exhaust mass flow rate by providing 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 at what ambient conditions cooling tower cells may be shut down.

b. Additional combinations of temperature and relative humidity or curves showing heat rejection vs. ambient condition and solar condition that will be used to more accurately represent the cooling tower exhaust conditions.

c. 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 confirmation of design limit in a Condition of Certification.

Response:

a. and b.) The requested cooling tower heat rejection, exhaust temperature, and exhaust mass flow rate data are provided in Table DR100-1. Temperature and relative humidity are also provided.

c.) The primary method for achieving design margin in the cooling tower system will be specifying the cooling tower to reject the design heat load at the design circulating water flows, design air flows and design temperatures assuming an inlet wet bulb 2 degrees F higher than the ambient wet bulb at the most stringent operating case. For low temperature cases, there may not be 2 degree F difference between wet bulb and dry bulb. In this instance, an inlet wet bulb 1 degree F higher than the ambient wet bulb will be assumed.

Table DR100-1. Cooling Tower Data

Parameter	Cooling Tower Exhausts								
Number of Cells	10 cells (2 by 5)								
Cell Height*	19.0 meters (62.34 feet)								
Cell Diameter*	8.53 meters (28 feet)								
Tower Housing Length*	91.65 meters (300.7 feet)								
Tower Housing Width*	33.13 meters (108.7 feet)								
Plant Operating Mode	2 x 100%- Solar with Partial Firing, Fired, and Unfired								
Ambient Temperature*	18°F			59°F			77°F		
Ambient Relative Humidity	60%			60%			40%		
Duct Firing (°F), Solar with Partial Duct Firing(S)	S	F	none	S	F	none	S	F	none
Number of Cells in Operation	9	9	8	10	10	10	10	10	10
Heat Rejection (MW/hr)	473.5	443.0	311.8	467.0	435.5	306.2	464.4	432.8	303.8
Exhaust Temperature (°F)	65.02	63.0	56.27	80.70	79.33	73.14	86.07	84.85	79.38
Exhaust Flow Rate (klb/hr)	62,673	62,594	55,367	64,075	63,991	63,571	62,007	61,992	61,495
*Ambient conditions and heat rejection, neglecting water makeup and blowdown, are based on the three lowest temperate cases shown in Appendix G.4 Table G.4-2. Cooling tower size parameters from Table 6.13-9.									

Data Request 101:

Please provide the cooling tower manufacturer and model number information and a fogging frequency curve from the cooling tower vendor, if available, that corresponds to the altitude of the project site.

Response:

The cooling tower manufacturer is SPX Cooling Technologies
The cooling tower is Marley Model: F4910A-7.9-10B
Fogging Frequency Curve: see Attachment 101-1.

Data Request 102:

Please confirm that the cooling tower fan motors will not have variable speed/flow controllers.

Response:

Fan motors and controllers will be either single speed or two speed systems. Variable Speed Controllers (Variable Frequency Drives) will not be used.

Data Request 103:

Please provide the SACTI model input/output files, including the meteorological data input files that were used to provide the plume data shown in Section 6.13 and Section 6.15 of the AFC.

Response:

The SACTI model input/output files, including the meteorological data input files are provided on the enclosed CD.

Data Request 104:

Please provide the following:

a. Describe and analyze the size and frequency of any commonly occurring existing, visible plumes from industrial sources within a two-mile radius of the proposed facility;

b. Discuss the cumulative visual effect and significance of the existing visible plumes when combined with expected plumes from the Victorville 2 project; and

c. Discuss any proposed mitigation options.

Response:

a. There are no significant sources of water vapor (visible) plumes within two miles of the VV2 Project site. However, the High Desert Power Project (HDPP) operates a gas turbine combined cycle power plant adjacent to the Southern California Logistics Airport. The northern boundary of the HDPP power block is approximately 2.4 miles south of the VV2 Project site.

b. It is not expected that there will be any significant interactions between visible plumes from the VV2 Project and the HDPP.

c. No mitigation is necessary given the lack of significant interaction between the VV2 Project visible plume and any other visible plume(s) in the Project vicinity.