Response to CEC Staff Data Adequacy Comments

Technical Area: Water Resources

Following are additional information and/or clarifications in response to the specific issues raised in the CEC staff Data Adequacy review. For each specific area where the AFC was considered inadequate by CEC staff, the applicable section of the CEC Siting Regulations is identified, followed by the "Information Required to Make AFC Conform with Regulations", followed by the supplemental/clarifying information.

WATER-1. Appendix B (g) (14) (D) (ii).

Information Required:

Please provide the design criteria and conceptual drainage plans/BMPs for the construction and operational phases of the project.

Response:

The existing topographic conditions of the Victorville 2 Project site depict an average slope of one percent toward the north. Moreover, a ridgeline located in the middle of the site causes the surface runoff to flow to the west or east of the site. The east side of the proposed site has a steep slope of 7 to 12 percent to the east, while the west side slopes at 0.8 to 1 percent to the west.

For purposes of developing drainage plans for the Project site, the Power Block (the roughly 25-acre area of the overall site where the combined-cycle generating equipment will be located) and the Solar Field (the remaining approximately 250 acres of the site) were divided into independent drainage systems. Each area has its own discharge location. The Solar Field will discharge along the entire length of the north side of the development area, while the Power Block will discharge through the outlet pipe of the Sediment Retention Facility (see Figures 6.17-2 and 6.17-3 which illustrate the conceptual drainage plans during Project construction and during Project operations, respectively).

The Power Block Area, located at the southeast corner of the property, is situated at the high point of the existing site. The Power Block Area will drain to the north and south by means of sheet flow, swales, inlets, and/or storm sewer pipes. At the north and south sides of the Power Block the runoff will be intercepted by a system of channels, culverts and/or storm sewers that will convey the storm water to the east. The storm water runoff will then be discharged into the Sediment Retention Facility located on the east side of the Power Block Area.

The Solar Field will be graded at a 0.5 percent slope and storm water will drain to the north. The small slope will keep storm water flow rates low, thus minimizing the amount of sediments picked up by the runoff. In addition, applying a dust-controlling agent such as Dirt Glue or a similar product will stabilize sediments in the solar field.

The Sediment Retention Facility and all other Project drainage features are designed to contain and/or convey the 100-year frequency return storm as specified on page 1 of the City of Victorville's, Standard Specifications for Public Improvements (City of Victorville, 1976) and in section A.2 of the San Bernardino County Hydrology Manual (Williamson and Schmid, 1986). Table 6.17-4 shows precipitation and discharge data for 2-year and 100-year storm events for predevelopment and post development conditions for both the Power Block and Solar Field areas. These data provide the basis for sizing the Sediment Retention Facility shown on Figures 6.17-2 and 6.17-3. The objective was to size the Sediment Retention Facility and outfall structure such that the discharge from the facility will not exceed the predevelopment conditions. It should be noted that although the current design approach is based on preliminary assumptions and may require modifications during final design, the design concept will remain the same.

The peak flow rates shown on Table 6.17-4 were determined using a computer aided, watershed modeling software called Hydraflow Hydrographs. This program utilizes the Natural Resources Conservation Service's TR-55 methods. Precipitation data and soil group information were obtained from the San Bernardino County Hydrology Manual.

Table 6.17-4
Hydrologic Analyses for Predevelopment and Post Development Conditions

	Power Block Predevelopment	Power Block Post Development	Solar Field Predevelopment	Solar Field Post Development
Area	25.85 acres	25.85 acres	250.14 acres	250.14 acres
Curve Number[1]	75	97	75	75
Precipitation - 2-Year Storm	1.2 inches	1.2 inches	1.2 inches	1.2 inches
Precipitation - 100-Year Storm	3.5 inches	3.5 inches	3.5 inches	3.5 inches
Discharge - 2-Year Storm	0.16 cfs	18.09 cfs	1.53 cfs	1.53 cfs

[1] The curve number is a coefficient used in the TR-55 method of the Natural Resources Conservation Service. The number classifies the land use and soil type of the watershed that is being analyzed.

	Power Block Predevelopment	Power Block Post Development	Solar Field Predevelopment	Solar Field Post Development
Discharge - 100-Year Storm	13.65 cfs	60.93 cfs	67.71 cfs	67.71 cfs

One purpose of the Sediment Retention Facility is to provide the capacity to make up the difference between the pre- and post development runoff conditions. The facility also provides detention time; which allows sediments to settle out of the runoff before it is discharged to the existing drainage features. The design of the proposed Sediment Retention Facility was based on document SE-2 of the California Stormwater BMP Handbook – Construction (California Stormwater BMP, 2003) and the San Bernardino County Hydrology Manual. The Sediment Retention Facility is protected from erosion by placing riprap stone at all runoff entrance points to the facility. The riprap stone is placed from the discharge point and is continued down the slope to at least the bottom of the facility. The Sediment Retention Facility will have at least three feet of freeboard above the 100-year storm event. The berm of the facility will be protected against storms greater than the 100-year event by a riprap lined emergency overflow spillway. The outlet structure for the Sediment Retention Facility will consist of a concrete riser with a grated opening on top, a small orifice near the bottom, and an outlet pipe to direct the flow to the existing ground. The existing ground at the discharge point of the outlet pipe will be protected from erosion using riprap stone.

During Project construction, silt fence will be constructed to prevent sediments in storm water runoff from leaving the site. The silt fence depicted in Figure 6.17-3 will be in place prior to any clearing or grading operations. Since the grading of the overall site (Power Block and Solar Field areas) will take place in phases, prior to the start of grading of each phase area, temporary silt fencing will be added around the perimeter of that area on the sides not bounded by the overall Project site silt fence. After silt fencing is installed and the grading of the Power Block area begins,, construction of the Sediment Retention Facility and outlet structure will be the initial activity. As the Sediment Retention Facility and outlet structure are constructed, a temporary swale on the west side of the Sediment Retention Facility also will be constructed as depicted in Figure 6.17-3 to drain the Power Block into the Facility during the remaining 3 to 4 months of the Power Block grading activities.

Sediment volumes will be greater during construction than during operations. Therefore, sediments that have accumulated in the Sediment Retention Facility during construction may need to be removed during and/or at the end of construction to ensure that the facility

functions properly. Temporary and permanent ditches that carry runoff to the Sediment Retention Facility will be protected against erosion during construction, using flow check dams constructed of hay bales. As permanent storm sewer pipes and culverts are added during construction, they will be protected from receiving sediments using silt fencing that will enclose the inlets. Areas disturbed during construction in the Power Block Area will be stabilized with straw or other suitable material until the final surface is established. The Solar Field will be stabilized during the construction phase with Dirt Glue or a similar product. All construction entrances will have a granular area to remove soil from vehicle tires prior to leaving the site. Dust will be controlled during construction by watering and using Dirt Glue or a similar product. All erosion control measures will be in accordance with Section 3 of the California Stormwater BMP Handbook – Construction.[2]

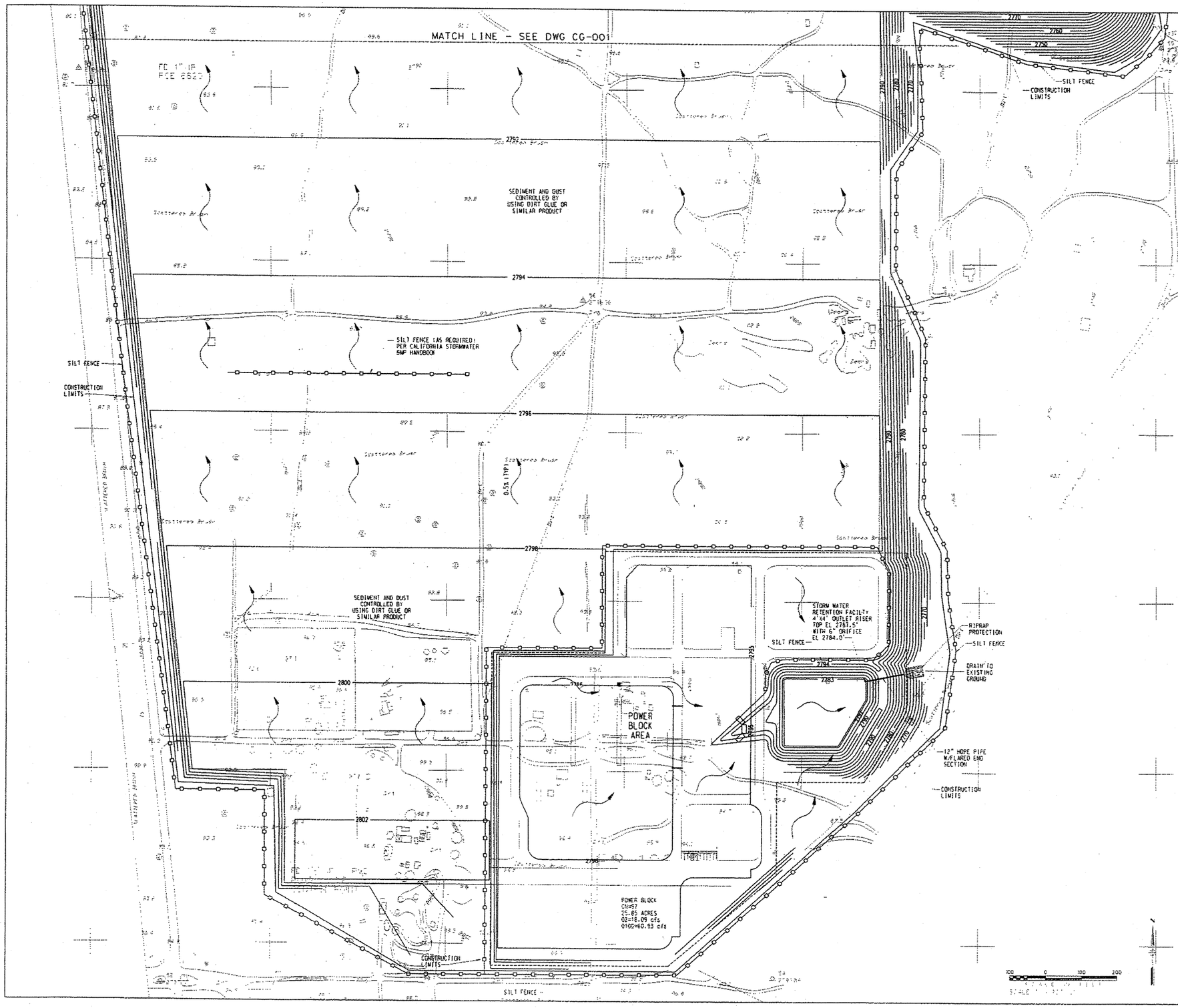
References.

City of Victorville. 1976. California Standard Specifications for Public Improvements.

State of California. 2003. California Stormwater BMP Handbook - Construction.

Williamson and Schmid, Civil Engineers. 1986. County of San Bernardino Hydrology Manual.

[2] California Stormwater BMP, 2003.



STORM WATER RETENTION FACILITY DESCRIPTION
CAPACITY = 16,090 CY
PRE DEVELOPMENT DISCHARGE = 13.65cfs
POST DEVELOPMENT DISCHARGE = 1.70cfs
POST DEVELOPMENT DISCHARGE VELOCITY = 6.87 FT/S

- PRELIMINARY -
NOT FOR CONSTRUCTION

CONFIDENTIAL

NO.	DESCRIPTION	DWN	CHK	APP	DATE
2	ISSUED FOR REVIEW	SMC			03-29-07

KIEWIT INDUSTRIAL CO.
A Kiewit Company

Figure 6.17-2
Sheet 1 of 2

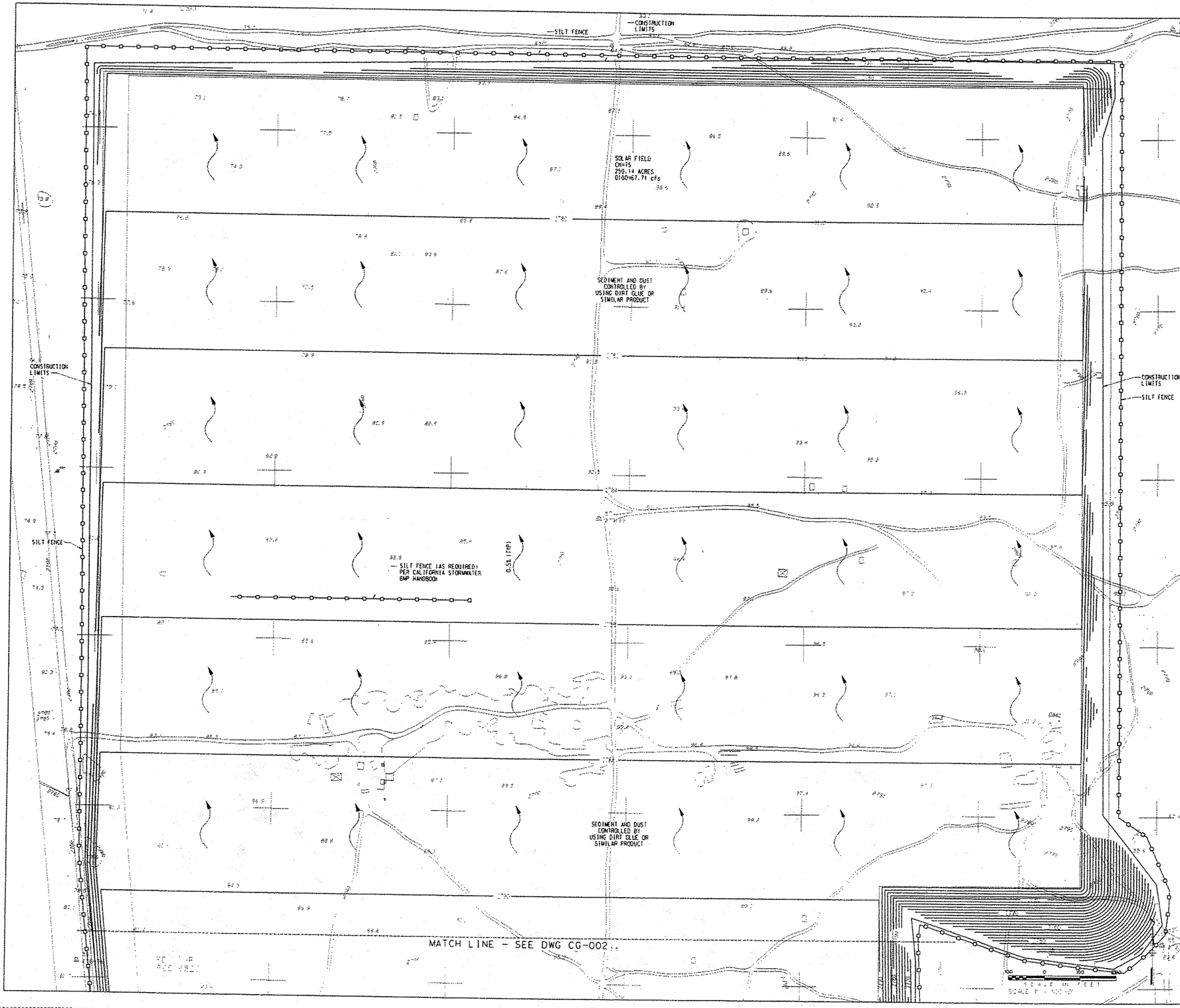
Victorville 2 Hybrid
Power Project

Bibb and associates

STORM WATER AND SEDIMENT CONTROL DURING CONSTRUCTION

DESIGNED
DRAWN
CHECKED
APPROVED

DRAWING NUMBER
SKC-2006038 CG-004-032907



- PRELIMINARY -
NOT FOR CONSTRUCTION

CONFIDENTIAL

KIEWIT INDUSTRIAL CO.
A Kiewit Company

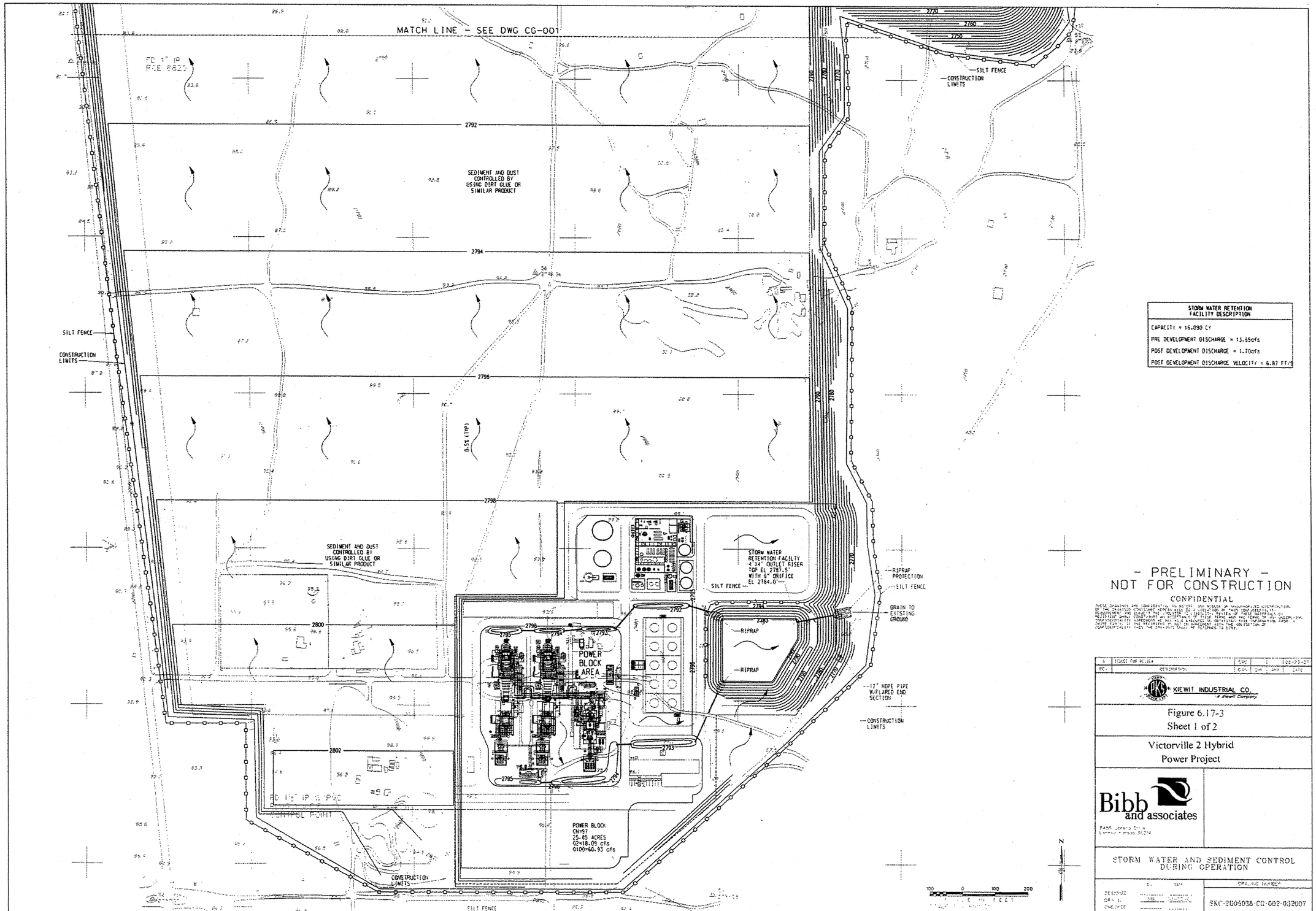
Figure 6.17-2
Sheet 2 of 2

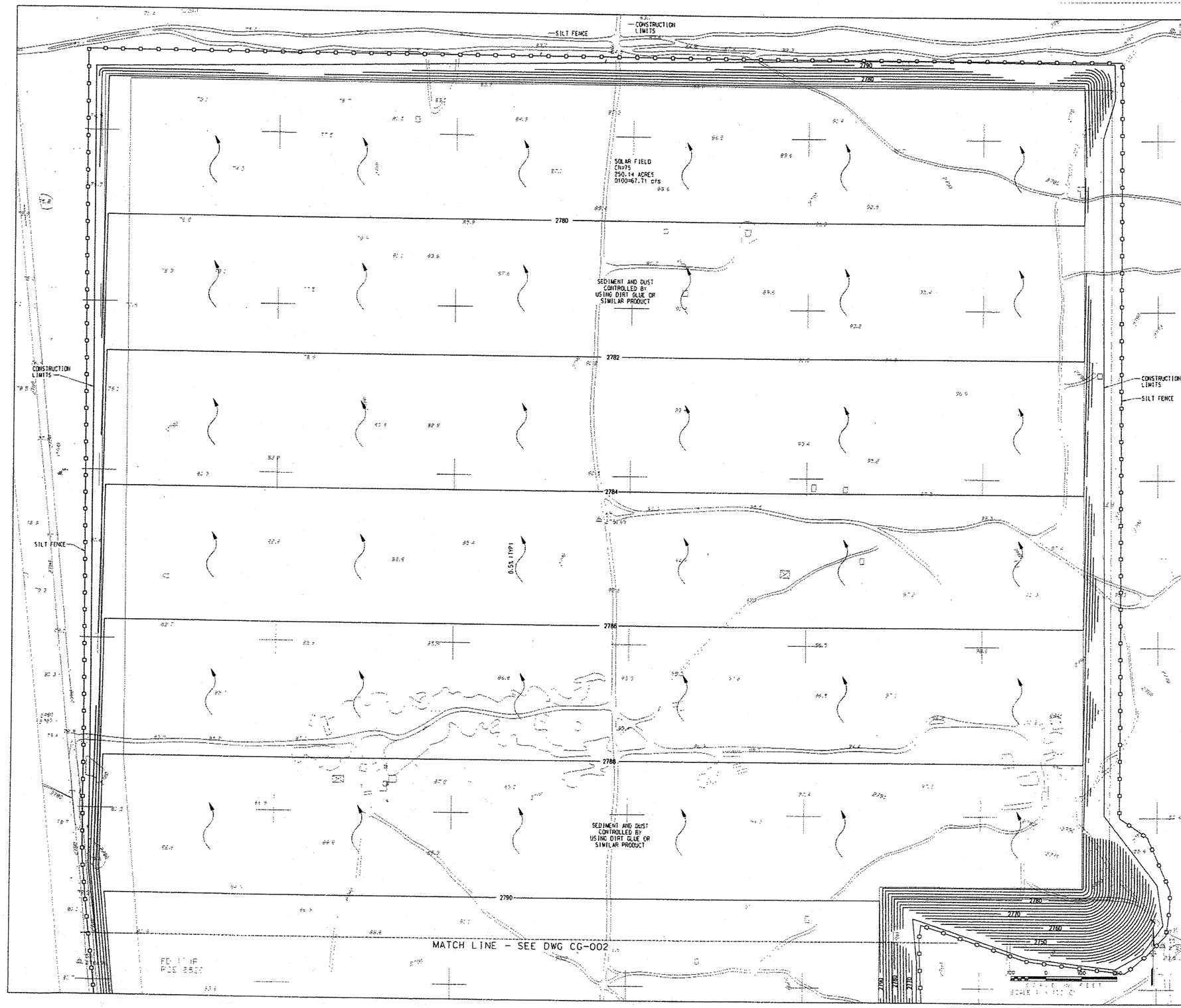
Victorville 2 Hybrid
Power Project

Bibb and associates

STORM WATER AND SEDIMENT CONTROL DURING CONSTRUCTION

SKC-2005038 CG-003-032907


MATCH LINE - SEE DWG CG-001
SEDIMENT AND DUST CONTROLLED BY USING DIRT GLUE OR SIMILAR PRODUCT
SILT FENCE
CONSTRUCTION LIMITS
STORM WATER RETENTION FACILITY 4'X4' OUTLET RISER TOP EL 2787.5' WITH 6" ORIFICE EL 2784.0'
POWER BLOCK AREA
RIPRAP
RIPRAP PROTECTION
DRAIN TO EXISTING GROUND
12" HDPE PIPE W/FLARED END SECTION
POWER BLOCK CN=97 25.85 ACRES Q2=18.09 cfs Q100=60.93 cfs
STORM WATER RETENTION FACILITY DESCRIPTION
CAPACITY = 16,090 CY
PRE DEVELOPMENT DISCHARGE = 13.55cfs
POST DEVELOPMENT DISCHARGE = 1.70cfs
POST DEVELOPMENT DISCHARGE VELOCITY = 6.87 FT/S
- PRELIMINARY -
NOT FOR CONSTRUCTION
CONFIDENTIAL
KIEWIT INDUSTRIAL CO.
A Kiewit Company
Figure 6.17-3
Sheet 1 of 2
Victorville 2 Hybrid
Power Project
Bibb and associates
STORM WATER AND SEDIMENT CONTROL DURING OPERATION
SKC-2005038-CG-002-032007



- PRELIMINARY -
NOT FOR CONSTRUCTION

CONFIDENTIAL

REV	DESCRIPTION	DWN	CHK	APP	DATE
1	ISSUED FOR REVIEW	SMC			03-23-07

KIEWIT INDUSTRIAL CO.
A Kiewit Company

Figure 6.17-3
Sheet 2 of 2

Victorville 2 Hybrid
Power Project

Bibb and associates

STORM WATER AND SEDIMENT CONTROL DURING OPERATION

DRAWING NUMBER
SKC-2006038-CG-001-032007