

Preliminary Draft Plan

Bullard Energy Center

Fresno, California
(06-AFC-8)

Drainage, Erosion, and Sediment Control Plan

Submitted to the:
California Energy Commission

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1.0 Introduction

The Bullard Energy Center (BEC) is a proposed simple-cycle electrical generating facility located at 5829 North Golden State Boulevard within the City of Fresno (City), California. The proposed plant site is situated on 12.3-acres (Assessor Parcel Number 505-080-22S) approximately 1.25-miles southeast of the intersection of Herndon Avenue and North Golden State Boulevard. The parcel is located in an industrial area of the City and zoned M-1, Light Industrial Use. Refer to Figure 3.1-1, *Site Location Aerial*, and Figure 3.1-2, *General Vicinity Map* from the November 2006 BEC Application for Certification (AFC) document.

This Preliminary Draft Drainage, Erosion and Sediment Control Plan (DESCP) has been prepared to comply with the California Energy Commission (CEC) for the proposed BEC project (06-AFC-8). The DESCP identifies potential impacts and ensures protection of water quality and soil resources for the BEC site and all linear facilities for both the construction and operational phases of the project. This Preliminary Draft DESCP has been prepared in response to CEC Staff Data Request #39 through #44 and includes the use of Best Management Practices (BMPs) and dewatering controls in accordance with applicable local, state, and federal regulatory requirements associated with the protection of water quality and soil resources. Furthermore, the DESCP will comply with Chapter 14, Article 3, Urban Storm Water Quality Management and Discharge Control of the City of Fresno Municipal Code which ensures the health, safety, and general welfare of citizens, and protects the water quality of watercourses and water bodies in a manner pursuant to and consistent with the federal Clean Water Act (33USC§1251 *et sequentes*) by reducing pollutants in urban storm water discharges to the maximum extent practicable (MEP) and by effectively prohibiting non-storm water discharges to the storm drain system.

This Preliminary Draft DESCP has been prepared in advance of the final construction planning and engineering design, during which the specific details regarding construction, schedule, and other aspects of erosion control design will be finalized. The DESCP will be updated and revised as the project progresses from the preliminary to the final design and construction phases. This process will occur after licensing and will be included in a future draft of the DESCP. Therefore, the level of detail in this document is commensurate with the current level of planning available for site grading and drainage.

1.1 Plan Elements

This Preliminary Draft DESCP contains elements A through I below, regarding site management activities and erosion/sediment control BMPs to be implemented during site mobilization, excavation, demolition, construction, operation and closure.

- A. **Vicinity Map** – a map at a minimum scale of 1 inch = 100 feet will be provided indicating the location of all project elements (construction site, laydown area,

- pipelines, etc.) with depictions of all significant geographic features including swales, storm drains, and sensitive areas.
- B. **Site Delineation** – All areas subject to soil disturbance for the BEC (project site, laydown area, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing boundary lines of all construction/demolition areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.
- C. **Watercourses and Critical Areas** – The DESCPC shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. Indicate the proximity of those features to the BEC construction, laydown, and landscape areas and all transmission and pipeline construction corridors.
- D. **Drainage Map** – The DESCPC shall provide a topographic site map at a minimum scale 1 inch = 100 feet showing all existing, interim and proposed drainage systems and drainage area boundaries. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours shall be extended off-site for a minimum distance of 100 feet in flat terrain.
- E. **Drainage of Project Site Narrative** – The DESCPC shall include a narrative of the drainage measures to be taken to protect the site and downstream facilities. The narrative should include the summary pages from the hydraulic analysis prepared by a professional engineer/erosion control specialist. The narrative shall state the watershed size in acres that was used in the calculation of drainage measures. The hydraulic analysis should be used to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the BEC construction and laydown areas.
- F. **Clearing and Grading Plans** – The DESCPC shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections or other means. The locations of any disposal areas, fills, or other special features will also be shown. Illustrate existing and proposed topography tying in proposed contours with existing topography.
- G. **Clearing and Grading Narrative** – The DESCPC shall include a table with the quantities of material excavated or filled for the site and all project elements of the BEC project (project site, lay down area, transmission corridors, and pipeline corridors) whether such excavation or fill is temporary or permanent, and the amount of such material to be imported or exported.
- H. **Best Management Practices Plan** – The DESCPC shall identify on the topographic site map the location of the site specific BMPs to be employed during each phase of construction (initial grading/demolition, project element excavation

and construction, and final grading/stabilization). BMPs shall include measures designed to prevent wind and water erosion.

- I. **Best Management Practices Narrative** – The DESCPC shall show the location (as identified in H above), timing, and maintenance schedule of all erosion and sediment control BMPs to be used prior to initial grading, during all project element (site, pipelines, etc.) excavations and construction, final grading/stabilization, and post-construction. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule should include post-construction maintenance of structural control of BMPs, or a statement provided when such information will be available.

1.2 Project Background

The BEC plant site is located approximately 1.25-miles southeast of the intersection of Herndon Avenue and North Golden State Boulevard, at 5829 North Golden State Boulevard, in the City of Fresno, California (refer to Figure 3.1-1, *Site Location Aerial*, and Figure 3.1-2, *General Vicinity Map* from the November 2006 BEC AFC document). The proposed plant site is a 12.3-acre parcel with Assessor Parcel Number 505-080-22S, with an elevation of approximately 300-feet above mean sea level, gently sloping down to the southeast with approximately a 1 percent grade. The BEC is a proposed simple-cycle electrical generating facility consisting of two General Electric (GE) LMS 100 natural gas-fired combustion turbine generators (CTGs). The temporary construction laydown and parking site is a 9.2-acre parcel located immediately to the north of the plant site. Power line easements run across the western portion of the laydown area from south to north. Refer to Figure 3.1-3, *Site Arrangement Plan* from the BEC AFC.

The BEC will be located in an area zoned for light industrial use. The site is currently used as a truck depot, construction equipment fabrication and storage yard. Access to the area is provided by North Golden State Boulevard. Major east-west roadways intersecting North Golden State Boulevard include Shaw Avenue to the south and West Herndon Avenue to the north with access at Highway 99.

Stormwater will be routed through culverts and swales to an infiltration basin located near the center of the BEC site (refer to Figure 3.3-1, *Preliminary Grading and Drainage* from the BEC AFC). The infiltration basin has been sized according to federal, state, and local guidelines. The infiltration basin and outlet structure will be capable of attenuating the peak discharge of the 100-year 24-hour storm event to pre-development conditions. Runoff from the infiltration basin will be discharged to ditch on the north side of the adjacent to the access road.

The proposed BEC project will comply with all applicable local, state, and federal regulatory requirements associated with the protection of water quality and soil resources.

1.3 Watercourses and Critical Areas

The proposed project site is located within the Kings Subbasin of the San Joaquin Valley Groundwater Basin. The Kings Subbasin is bounded on the north by the San Joaquin River, which is located approximately two miles north of the site. The northwest corner of the subbasin is formed by the intersection of the east line of the Farmers Water District with the San Joaquin River. The west boundary of the Kings Subbasin is the eastern boundaries of the Delta-Mendota and Westside Subbasins. The southern boundary runs easterly along the northern boundary of the Empire West Side Irrigation District, the southern fork of the Kings River, the southern boundary of the Laguna Irrigation District, the northern boundary of the Kings County Water District, the southern boundaries of the Consolidated and Alta Irrigation Districts, and the western boundary of the Stone Corral Irrigation District.

The proposed BEC project site is located within an existing industrial use area. As a result, minimal native vegetation is present within the project area or vicinity. The proposed BEC project site is located within a paved active truck depot construction equipment and storage yard.

Insert Figure 3.1-1, *Site Location Aerial* from the BEC AFC

Insert Figure 3.1-2, *General Vicinity Map* from the BEC AFC.

Insert Figure 3.1-4, *Facility Plot Plan* from the BEC AFC.

Insert Figure 3.2-1, *Proposed Linear Routes* from the BEC AFC.

Insert Figure 3.3-1, *Preliminary Grading and Drainage* from the BEC AFC.

2.0 Drainage

The proposed BEC project site is located south of the San Joaquin River on the high alluvial fan of the San Joaquin River. The high alluvial fans of the San Joaquin and Kings rivers are two of the largest geomorphic features in the Fresno area. The Fresno area alluvial fans form part of a continuum of fans along the eastern margin of the San Joaquin Valley structural trough. The sediments are derived from the Sierra Nevada to the east. The east side fans are formed by meandering or braided stream floodplain processes that contain more well-sorted, fine-grained material and have gentler slopes and a longer radial profile with greater surface area than the semi-arid fans on the west side of the San Joaquin Valley. The project site elevation is about 300-feet above mean sea level and slopes gently with elevation decreasing to the south. The project site is situated on a thick section of Quaternary alluvial and lacustrine sediments overlying older Quaternary and Tertiary alluvial deposits, sedimentary rocks, and minor volcanic rocks, Tertiary to Jurassic sedimentary rocks of the Great Valley sequence, and Mesozoic and Paleozoic crystalline basement complex rocks. The existing site is paved and serves as a trucking company fueling and washrack depot and an independent construction company. The area surrounding the BEC site flows to the San Joaquin River, approximately two miles north of the project site. However, runoff from the proposed BEC project site will be directed to a groundwater recharge infiltration basin to be constructed on the west end of the facility.

The entire proposed BEC project site will be re-graded, except for the existing administration building located on the east side of the site, which will remain. The stormwater from the portions of the project site containing industrial activities will be conveyed by overland flow and swales to an infiltration basin located near the center of the BEC site (refer to Figure 3.3-1, *Preliminary Grading and Drainage* from the BEC AFC). The infiltration basin would capture approximately 85 percent of the annual stormwater runoff from the industrial areas of the site according to standards provided in the California Storm Water BMP Handbook. The infiltration basin will also serve to manage peak stormwater runoff during the 100-year 24-hour storm event. The peak runoff for the developed conditions will not exceed the peak runoff rate of the existing conditions. Stormwater runoff from the areas of the project site not containing industrial activities, include employee parking areas, switchyards, administration building, and open space areas, are not required to be permitted or managed and will run off-site as sheet flow.

3.0 Clearing and Grading

The proposed BEC project site is located entirely within an area of industrial development and within a paved active truck depot construction equipment and storage yard. The temporary construction laydown area is a 9.2-acre section of an existing open field consisting of approximately 22-acres. The open field area is dominated by non-native vegetation with some scattered native vegetation. No vegetation will need to be cleared on the proposed BEC project site. The construction laydown area shows signs of having been recently tilled in some areas, highly disturbed and dominated by non-native annual grasses and weeds. The existing asphalt and concrete will be removed and the proposed BEC project site will be re-paved, except for the existing administration building, which would remain in place. The asphalt and concrete removal will occur over a 2-month duration and active soil grading is anticipated to occur over a 2-month period within the project site and laydown area.

3.1 Location of Disposal Areas, Fills, or Other Special Areas

The proposed BEC project will require the removal and disposal of asphalt, concrete, loose rock, organic matter, earth, sand and gravel. Materials suitable for backfill will be stockpiled at designated locations using proper erosion protection methods. If contaminated material is encountered during excavation activities, disposal of such materials will comply with applicable laws, ordinances, regulations, and standards (LORS). Areas to be backfilled will be prepared by removing unsuitable materials and rocks. The bottom of excavation areas will be examined for loose or soft areas, excavated fully and backfilled with compacted fill. Backfilling will be completed in layers of uniform, specified thickness accomplished by properly moistening soils to achieve the specified density. To verify compaction, field density and moisture-content tests will be performed during compaction.

Approximately 36,000-cubic yards (cy) of fill will be imported to establish finish grade. Graded areas will be smooth, compacted, free from irregular surface changes, and sloped to drain. Geogrid reinforcement will be used for fills along slopes to resist seismic loading and slopes for embankments will be no steeper than 2:1 (horizontal:vertical). In areas where fills are to be laced on subgrades sloped at 6:1 (horizontal:vertical) or greater, keys into the existing subgrade may be provided to withstand horizontal seismic ground accelerations. The following table summarizes the quantities of materials excavated and filled for the project site.

Table 1, Earthwork Quantities

Earthwork	Cubic Yards (cy)
Material Removed (Excavation/Concrete Demolition)	17,800-cy
Material Cut	2,600-cy
Material Fill	20,800-cy
Net Fill to be Imported	36,000-cy

Site preparation and construction of the proposed BEC project may involve the excavation of contaminated soils. If encountered, contaminated soils will be stored temporarily in construction zones and removed for disposal or treatment and recycling. Contaminated excavated materials will be handled in accordance with applicable federal, state, and local regulations.

3.2 Existing and Proposed Topography

The existing site is currently in industrial use with relatively flat topography with a slight slope to the south and unnatural runoff drainage. The site elevation is approximately 300-feet above mean sea level and slopes gently to the southeast at approximately a 1 percent grade (refer to Figure 3.3-1, *Preliminary Grading and Drainage* from the BEC AFC). Approximately 36,000-cy of fill will be imported to the site to achieve finish grade. The project site will be compacted, free of irregular surface changes, covered with asphalt, concrete or gravel, and drainage will be controlled through a storm drainage system.

3.3 Volumes of Cut and Fill

As mentioned above, the grading of the site to design elevations will require approximately 36,000-cy of fill. Furthermore, excavation work will require the removal of approximately 17,800-cy of the existing concrete and asphalt from the site.

3.4 Gas, Water, and Sewer Pipelines

The proposed BEC project will include the construction of new pipelines to supply natural gas, water, and sewer connections. The trench excavated for the construction of these pipelines will be refilled. No surplus soil is expected as a result of pipeline connections.

4.0 Project Schedule

The proposed BEC project construction schedule is shown in the table below.

Table 2, BEC Construction Project Schedule

Activity	Date
Start Construction	April 2008
-Asphalt/Concrete Removal Duration	2 months
-Rough Grading, Fill Import Duration	2 months
-Concrete Foundation Pours Duration	8 months
-Switchyard Construction Duration	5 months
Startup and Test	April 2009
Commercial Operation	August 2009

Note: Some construction activities will overlap and occur concurrently.

Construction of the generating facility, from site preparation and grading to commercial operation is expected to last from April 2008 to August 2009.

5.0 Best Management Practices

The proposed BEC project has been designed to impact as small an area as possible at any given time, limiting the amount of exposed soils. Construction will proceed in a timely manner to ensure that as little soil as possible is exposed for as short a duration as possible. The following sections present standard construction Best Management Practices (BMPs) most of which are described in the California Storm Water Best Management Practice Handbook and the Caltrans Storm Water Quality Handbooks Construction Site best Management Practices Manual. These resource handbooks provide comprehensive details on BMP implementation and will be reviewed by managers for all construction contractors that may have an impact on the implementation of the DESCP. The listing and working details for Caltrans construction site BMPs are provided in Appendix A, *Best Management Practices*. A figure showing the location of all BMPs to be used during construction will be developed during the final project design phase.

The recommended construction BMPs for stormwater pollution prevention at the proposed BEC project site, including laydown areas and linear facilities, are described below. Construction activities that require BMPs include temporary soil stabilization, temporary sediment control, wind erosion control, tracking control, non-storm water management, and waste management and materials management control. The Contractor, during the construction phase, may implement additional control measures, as applicable.

5.1 Control Measures

The construction phase of the proposed BEC project will require grading, excavation, pad construction, and equipment installation. Construction will proceed in a timely manner to reduce exposure of soils and BMPs will help to maintain water quality, lessen erosion impacts, and aid in the prevention of dust generation. Based on findings of a Phase I Environmental Site Assessment (ESA), it is unlikely that contaminated soil would be encountered during the construction phase. A Phase II ESA, including a geophysical survey and collection of surface and subsurface soil samples would be conducted at the project site to locate potential toxic contaminants prior to construction. Furthermore, the proposed BEC project would obtain coverage under the General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ) for construction activities at the project site. In addition, stormwater runoff during the construction phase will be managed in accordance with the Storm Water Pollution Prevention Plan (SWPPP), as a separate document from the DESCP.

Temporary erosion control measures, such as re-vegetation, mulching, dust suppression, berms, ditches and sediment barriers, will be implemented before construction begins and maintained during the entire construction process. Furthermore, a mitigation monitoring, and reporting plan will be developed with CEC Staff to set performance standards and monitor the effectiveness of BMPs. The plan will identify responsibilities, monitoring methods, timing and reporting requirements.

The infiltration basin will be implemented early in the development of the BEC to treat runoff during the construction phase of the project and the final developed project. In addition, the following control measures may be implemented for the proposed BEC project. The Caltrans Storm Water Quality Handbooks Construction Site Best Management Practices Manual designation is identified within parentheses:

5.1.1 Temporary Soil Stabilization

Temporary soil stabilization consists of preparing the soil surface and applying BMPs to disturbed soil areas. Temporary concentrated flow conveyance controls consists of a system of BMPs that are implemented to intercept, divert, convey and discharge concentrated flows with a minimum of soil erosion, both on-site and downstream of the project site.

- Scheduling and progress of activities (SS-1)
- Hydroseeding (SS-4)
- Soil Binders (SS-5)
- Straw Mulch (SS-6)
- Geotextiles, Plastic Covers & Erosion Control Blankets/Mats (SS-7)
- Earth Dikes/Drainage Swales & Lined Ditches (SS-9)
- Outlet Protection/Velocity Dissipation Devices (SS-10)
- Slope Drains (SS-11)

5.1.2 Temporary Sediment Control

Temporary sediment control practices include those practices that intercept and slow or detain the flow of storm water to allow sediments to settle and be trapped. These practices can consist of installing temporary linear sediment barriers, providing berms, fiber rolls, and dams or constructing a temporary sediment basin or sediment trap. Linear sediment barriers are placed below the toe of exposed and erodible slopes, downslope of exposed soil areas, around temporary stockpiles, and at various locations along the project site perimeter.

- Silt Fence (SC-1)
- Sediment/Desilting Basin (SC-2)
- Sediment Trap (SC-3)
- Check Dams (SC-4)
- Fiber Rolls (SC-5)
- Gravel Bag Berm (SC-6)
- Street Sweeping and Vacuuming (SC-7)
- Sandbag Barrier (SC-8)
- Straw Bale Barrier (SC-9)
- Storm Drain Inlet Protection (SC-10)

5.1.3 *Wind Erosion Control*

Wind erosion control consists of applying water or other dust suppressors as necessary to prevent or alleviate dust nuisance: Wind Erosion Control (WE-1).

5.1.4 *Tracking Control*

Tracking control consists of preventing or reducing construction vehicles and equipment from tracking mud, dirt, and other construction debris from entering a storm drain, watercourse, or public roads.

- Stabilized Construction Entrance/Exit (TC-1)
- Stabilized Construction Roadway (TC-2)
- Entrance/Outlet Tire Wash (TC-3)

5.1.5 *Non-Storm Water Management*

Non-storm water management BMPs are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source before they come into contact with storm water. These practices involve day-to-day operations of the construction site and are controlled by the Contractor. These BMPs require the construction site to be clean and orderly at all times.

- Water Conservation Practices (NS-1)
- Dewatering Operations (NS-2)
- Paving and Grinding Operations (NS-3)
- Illicit Connection/Illegal Discharge Detection and Reporting (NS-6)
- Vehicle and Equipment Cleaning (NS-8)
- Vehicle and Equipment Fueling (NS-9)
- Vehicle and Equipment Maintenance (NS-10)
- Concrete Finishing (NS-14)

5.1.6 *Waste Management and Materials Pollution Control*

Similar to non-storm water management BMPs, waste management and materials pollution control BMPs are source control BMPs that prevent pollution by limiting or reducing potential pollutants at their source before they come into contact with storm water. They require a clean and orderly construction site and controlled by the Contractor on a daily basis.

- Materials Delivery and Storage (WM-1)
- Material Use (WM-2)
- Stockpile Management (WM-3)
- Spill Prevention and Control (WM-4)
- Solid Waste Management (WM-5)

- Hazardous Waste Management (WM-6)
- Contaminated Soil Management (WM-7)
- Concrete Waste Management (WM-8)
- Sanitary /Septic Waste Management (WM-9)
- Liquid Waste Management (WM-10)

Appendix A

Best Management Practices