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November 21, 2014

VIA E-FILING

Carlsbad Energy Center Project (07-AFC-06C)
Mike Monasmith, Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Carlsbad Energy Center Project Petition to Amend (07-AFC-06C)
Responses to Data Requests Set 4 (Nos. 86-92)

Dear Mr. Monasmith:

California Energy Commission staff ("Staff") filed Data Requests Set 4 (Nos. 86-92) (TN 203263) (the "Data Requests") on October 28, 2014, regarding Carlsbad Energy Center LLC's ("Project Owner") Petition to Remove Obsolete Facilities to Support Construction ("PTR") of the Carlsbad Energy Center Project (07-AFC-06C) ("CECP") and Petition to Amend ("PTA") the CECP. Project Owner hereby submits responses to the Data Requests.

Please contact me if you have questions.

Locke Lord LLP

By: 
John A. McKinsey
Attorneys for Carlsbad Energy Center LLC

JAM:dh

Carlsbad Energy Center Petition to Amend

(07-AFC-06C)

Data Response Set 4 (Response to Data Requests 86 to 92)

Submitted to
California Energy Commission

Prepared by
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November 21, 2014

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Introduction

Attached are Carlsbad Energy Center LLC (Project Owner) responses to the California Energy Commission (CEC) Data Request, Set (numbers 86 through 92) regarding the Carlsbad Energy Center Project (CECP) (07-AFC-06C) Petition to Amend (PTA).

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as the CEC presented them and are keyed to the Data Request numbers.

New or revised graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 1 would be numbered Table DR1-1. The first figure used in response to Data Request 1 would be Figure DR1-1, and so on. Figures or tables from the CECP PTA that have been revised have “R1” following the original number, indicating revision 1.

Additional tables, figures, or documents submitted in response to a data request (for example, supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of each discipline-specific section and are not sequentially page-numbered consistently with the remainder of the document, though they may have their own internal page numbering system.

Soil and Water Resources (86–90)

BACKGROUND: RECYCLED WATER DISCHARGE

On September 24, 2014, staff attended a publicly noticed workshop along with the petitioner, intervenors, and agency staff, in the City of Carlsbad. In attendance from the city were Terry Smith, Senior Engineer of the City of Carlsbad Utilities and Gary Barberio, Assistant City Manager. One of the topics of discussion was the design of the amended CECP's industrial wastewater discharge system, if reclaimed water were used for industrial purposes. The Reclaimed Water Balance diagram (Petition to Amend [PTA], Figure 2.1-3b) indicates the petitioners' intent to discharge a peak daily amount of 262 gallons-per-minute (gpm) to the Encina Wastewater Authority (EWA) sewer system. The discharge to the sewer system would flow to the Encina Water Pollution Control Facility (EWPCF) approximately 1.5 miles south of the Encina Power Station site, where it would be treated. A portion of the EWPCF discharge goes directly to the ocean and a portion goes to the Carlsbad Water Recycling Facility (CWRF), where it is treated to tertiary standards and delivered throughout the city for authorized reclaimed water uses.

The amended Carlsbad Energy Center Project (amended CECP) use of up to 675 gallons per minute (gpm) of reclaimed water would result in a significant increase in total dissolved salts (TDS) or 'salinity' of associated wastewater flows into the EWA system. Salinity concentrations in wastewater treatment plants discharge are limited through state and federal regulation by the San Diego Regional Water Quality Control Board (SDRWQCB). The treatment processes at the treatment plants do not remove salts from the wastewater they receive. Therefore, there is potential for the proposed wastewater discharge to impact the treatment plant's ability to comply with applicable regulations and standards stipulated in their permit.

The petitioner submitted a formal request to the city, dated August 1, 2014, requesting their acceptance of wastewater volume amounts expected from the amended CECP (TN# 203099). The city staff in attendance at the September 24, 2014 meeting indicated that the discharge would likely contain high levels of TDS that would be unacceptable by the EWPCF. City staff described how their reclaimed water facility is already receiving the maximum allowable levels of TDS and cannot accept higher levels from the amended CECP. For this reason, the applicant's request for sewer service of the amended CECP's wastewater discharge would likely not be accepted.

The PTA indicated that the petitioner was currently considering their options for reconfiguring their proposed discharge design. Options under consideration included constructing a new "brine" discharge line from the EWPCF to the ocean; direct discharge from the amended CECP site to the ocean; and, additional onsite treatment facilities at the amended CECP site prior to discharge into the sewer system. In order to complete an environmental analysis and ensure LORS compliance, staff needs additional information on the proposed methods) for treatment and disposal of the industrial wastewater discharged from the amended CECP.

DATA REQUESTS 86-90

86. Please describe alternative wastewater discharge options currently under consideration for the amended CECP, including flow diagrams showing how the discharges would be routed and/or treated.
87. For each discharge option under consideration, please specify the ultimate discharge location.
88. If any new offset facilities and linear facilities are required to handle wastewater flows, please identify what they are, where they would be located, area(s) of expected and potential disturbance, and what approvals would be needed for construction

89. If post treatment of industrial wastewater at the project site is proposed prior to discharge into the EWA sewer system, please identify what equipment will be required and where it will be located on the project site.
90. For each discharge option being considered, please describe the potential for schedule delays related to any potential permits required by SDRWQCB in terms of the acceptance of increased wastewater discharge. For instance, will the discharge require Waste Discharge Requirements (WDRs) from the SDRWQCB, or a will-serve acceptance from the city of Carlsbad and/or Encina Wastewater Authority?

General Response to Data Requests 86-90

In response to the TDS acceptance limit indicated by the Encina Wastewater Authority, the Project Owner has evaluated potential options for water treatment and discharge of effluent from the treatment process. As a result of this evaluation, Project Owner has identified and now proposes the following modification to the onsite water treatment process that essentially eliminates onsite discharge of plant process water. Project Owner believes this modification is the best and most viable solution to the issue, and a modification that has virtually no discernable or significant change to the Amended CECP's design, function and presence. No new discharge streams will be introduced and, in fact, the proposed process water discharge volumes are substantially reduced as compared to the Amended CECP and water usage for the Amended CECP is also reduced.

The modification involves using additional onsite demineralizer-based pre-treatment to provide the high quality industrial water for CECP, which also allows elimination of the previously proposed use of reverse osmosis treatment for CECP. Demineralization will continue to be accomplished using portable trailer-mounted demineralizer units as it was proposed in the PTA. This modification in the treatment process will be accomplished by simply increasing the use of the demineralizer trailers. The demineralizer trailers will be located within the same footprint as the ocean water purification system. No significant change to the preparation or construction of the surface on which the demineralizer trailer will be stored is anticipated.

Increasing the pretreatment of the proposed supply of reclaimed water using demineralization combined with improved water handling and re-circulation procedures and equipment for CECP will allow the most efficient use of water resources and minimize wastewater discharge. The result is that virtually all plant process wastewater streams will be recycled, leaving only small potable use/sanitary and oil/water separator effluent discharge streams that average only 17 gallons per minute (GPM) during plant operation. There is no new equipment required for this modification; instead there will be an increase in the number of demineralizer trailers on site at any one time and increase in the frequency that these trailers are exchanged during operations. The additional demineralizer trailer units will be located both where the reverse osmosis and demineralizer treatment was planned to be located and where the previously planned, but now eliminated, ocean water purification treatment system would have been. There will be little discernable difference in the general layout of the supporting equipment for the Amended CECP. The previously proposed ocean water purification option was recently surrendered by the Project Owner as a water supply option based on discussions with CEC staff.

The modification will involve increased use of trailer mounted demineralizer units. Trailer mounted demineralizer units allow for discreet water treatment systems without additions to water discharge constituent concentrations. Instead, when a demineralizer unit is completely utilized, it is replaced by a fresh unit while the depleted unit is transferred to an offsite vendor facility that provides and processes the units. In essence onsite liquid discharge is converted to a solids or concentrated brine that is removed from site for processing by the offsite vendor.

Description of Water Treatment and Discharge Process

The modification will continue to utilize recirculation and storage of water onsite using the CECP 500,000-gallon raw water storage tank. This tank will continue to have a dedicated capacity of 150,000 gallons for the fire water and 350,000 gallons for process water. Reclaimed water from the CECP raw water tank will be pretreated with a filter and then passed through a series of cation, anion and mixed bed demineralizers. The pre-filter and demineralizer vessels will be trailer-mounted and connected with piping and hoses. As the resin beds within a trailer are exhausted, the trailer will be disconnected and the trailer taken off-site to the trailer's lessors' facility for regeneration. Water required to initially rinse the demineralizers or to drain the demineralizers prior to off-site transport will be recycled into the CECP raw water storage tank or the CECP demineralized water storage tank, as appropriate, ensuring that no reject stream from the demineralizers will be discharged to the city sewer.

At peak power output and production from the Amended CECP, between two to five trailers a day could be exchanged, depending upon CECP dispatch. The demineralized water will continue to be stored in a dedicated 250,000-gallon demineralized water storage tank and used for NOx emission control of the combustion turbines. For NOx emission control, a portion of the demineralized water will continue to be mixed with reclaimed water in a 2,500-gallon mixing tank and then used for evaporative cooling of the inlet air for the Amended CECP combustion turbines, as needed to augment power production. The demineralized water, mixed with minimal, non-toxic cleaning chemicals, will also continue to be used for infrequent cleaning of the internal components of the Amended CECP combustion turbines during scheduled outages.

The reclaimed water with trailer-mounted demineralizers water balance diagrams (Figures DR86-1and DR86-2) show revised water balances and process flow for both a daily maximum and yearly average use. Figure 2.1-1R shows the location of water treatment and handling equipment on site. Several other figures are provided in revised form with this data response set to ensure consistency in the project description, Figure 2.0-1R Site plot plan and Figure 3.1-1R Transmission Lines.

Water Requirements

The estimated average daily, maximum daily, and maximum annual quantity of reclaimed water required for operation of the Amended CECP with the modification is presented in Table DR86-1. The daily water requirements shown are estimated quantities based on the simple-cycle plant operating at a 31 percent capacity factor, with evaporative cooling.¹ With the modification to the industrial water treatment system discussed above, the Amended CECP will actually use less reclaimed water and discharge almost no operational plant wastewater, averaging less than 5gpm,.

TABLE DR86-1

Daily and Annual Water Use for Amended CECP Operations—Reclaimed Water Supply

Water Use	Average Daily Use (gpm)	Maximum Daily Use (gallons)	Maximum Annual Use* (afy)
Reclaimed Water	120	464,400	215
Potable Water	12	17,280	19.4

*Based on an annual operation of 2,700 hours/year at full plant output

¹ Peak water requirements shown in Tables 2.1-1 and 2.1-2 are based on the plant operating at full load, with evaporative cooling, and an ambient temperature of 96.0°F and 36.0 percent relative humidity.

Plant Cooling Systems

The Amended CECF's cycle heat rejection system will continue to consist of air-cooled fin-fan coolers, shell and tube heat exchangers with closed loop circulating water pumps and evaporative coolers. The heat rejection system will cool the CTG lube oil to within specified limits by the CTG manufacturer as well as reject the heat created by the high-temperature inter-cooler.

Mixed reclaimed and demineralized water will continue to be used for evaporative cooling. Mixing of reclaimed and demineralized water will continue to be necessary to avoid formation of scales on the evaporative cooler media.

It is estimated that 50 percent of the evaporative cooling water will be lost to atmosphere via CTG exhaust and the remaining 50 percent will be recycled to the raw water storage tank. The evaporative cooling water will not be treated with any chemicals.

Wastewater Collection, Treatment, and Disposal

Evaporative cooler blowdown and other plant industrial water will be internally recycled for reuse. Miscellaneous plant drains (sample cooling, pump leaks, equipment wash-water, etc.) will continue to be collected. Oil and suspended solids contamination will be removed by an oil/water separator and the balance will be discharged to the City of Carlsbad sewer system (at ~5 gpm). Wastewater from sinks, toilets, showers, eye washes and other sanitary facilities that originated from City supplied potable water will also be discharged to the City of Carlsbad sewer system (at ~12 gpm). The revised water balance diagrams, Figures DR86-1 and DR86-2, show the anticipated wastewater streams and flow rates for the Amended CECF with the modifications proposed in this Data Response. Total wastewater discharged to the City's sewer system during operations is estimated to be 17 gpm, of which 12 gpm will be potable use waters. This small waste water stream will easily be accommodated and serviced by the City of Carlsbad sewer system and the Encina Water Authority treatment systems.

Accidental leaks and discharges inside the power generating areas will be contained and disposed offsite, in accordance with approved Emergency Response and Spill Prevention, Control and Countermeasures (SPCC) Plans.

The trailer-mounted, demineralizer units will be regenerated off-site and will produce no liquid or solid wastes at the project site.

Environmental Effects

The addition of the trailer mounted demineralizers system and other water treatment equipment and process changes have no significant adverse environmental effects and actually provide substantial environmental benefits. The following is a brief evaluation or summary of the environmental effects and benefits in certain key disciplines:

Hazardous Materials

No new chemicals or materials are required to be brought on site to implement the modifications proposed in this data response. There will be an elimination of the RO system and increased use of the trailer-mounted demineralizer units.

Traffic and Transportation

The 2 to 5 truck trips (each trip consists of a replacement trailer mounted demineralizer trailer transported to the site and the spent trailer transported back to the vendors) per day to exchange the trailer mounted demineralizer are de minimis and are within the Project assumed daily average and peak truck trips that were analyzed in the PTA for both traffic and transportation. Therefore, the traffic analysis for Project as defined and analyzed in the PTA remains less than significant.

Water Resources and Water Quality

The proposed change reduces both Project water consumption and Project water discharged to the City sewer system. There are no changes to the types or volumes of hazardous materials that will be handled or used onsite and the depleted RO units that are removed for processing at the vendors facility contain benign salts and mineral compounds that are not classified as a hazardous material.

Visual Resources

The additional equipment will be located where the ocean water purification equipment would have been located. Based on the low profile of the trailer mounted demineralizer system other water treatment equipment, the planned water treatment area will essentially be not visible from outside of the CECP site.

The addition of the trailer mounted demineralizers system and other water treatment equipment and process changes has no potential to result in effects on the remaining environmental topics addressed in the PTA.

Specific Responses to Data Requests 86-90

DATA REQUEST

86. Please describe alternative wastewater discharge options currently under consideration for the amended CECP, including flow diagrams showing how the discharges would be routed and/or treated.

Response:

As explained above, the Project Owner has identified and proposed increased use of the trailer mounted demineralizer units to maximize water reuse and reduce waste water discharge to minimal amounts that are easily accommodated. These changes resolve any perceived compliance issues with Encina Wastewater Authority constituent limits. As discussed in the General Response to DRs 86 – 90 above, the addition of the trailer mounted demineralizers system and the corresponding elimination from further Project consideration of the ocean water purification system will not result in significant adverse environmental effects. In fact, with the reduced wastewater discharge and the removal of the ocean water purification system from further Project consideration will result in environmental improvements to the Project.

DATA REQUEST

87. For each discharge option under consideration, please specify the ultimate discharge location.

Response:

With the modification, waste water will continue, as proposed in the Amended CECP PTA and in the currently licensed CECP to be discharged to the Encina Waste Water Authority via a sewer line connection from the adjacent sewer line system. As discussed in the General Response to DRs 86 – 90 above, the actual volume of these discharge to the sewer system will be reduced as the discharge streams will consist primarily of potable use streams such as sanitary uses, emergency eyes wash, and showers.

DATA REQUEST

88. If any new offset facilities and linear facilities are required to handle wastewater flows, please identify what they are, where they would be located, area(s) of expected and potential disturbance, and what approvals would be needed for construction.

Response:

As discussed in the General Response to DRs 86 – 90 above no new linear facilities are necessary to implement the modification. The Amended CECF will continue to receive reclaimed water from a supply line coming from Cannon Road and continue to discharge its now minimal wastewater to the sewer line adjacent to the site.

DATA REQUEST

89. If post treatment of industrial wastewater at the project site is proposed prior to discharge into the EWA sewer system, please identify what equipment will be required and where it will be located on the project site.

Response:

No post treatment is proposed. Instead the reclaimed water supply will receive increased demineralization via portable trailer mounted units that are regenerated off site.

DATA REQUEST

90. For each discharge option being considered, please describe the potential for schedule delays related to any potential permits required by SDRWQCB in terms of the acceptance of increased wastewater discharge. For instance, will the discharge require Waste Discharge Requirements (WDRs) from the SDRWQCB, or a will-serve acceptance from the city of Carlsbad and/or Encina Wastewater Authority?

Response:

There are no schedule delays nor are there any changes to required permits or approvals, nor will it affect the will-serve from the City of Carlsbad and/or the Encina Wastewater Authority.

OFFICE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY	DRAWING NUMBER
GV, CO	11/20/14	D. DAVIS	D. DAVIS	E. HOLDEN	D. DAVIS	CECP-WB-001-D

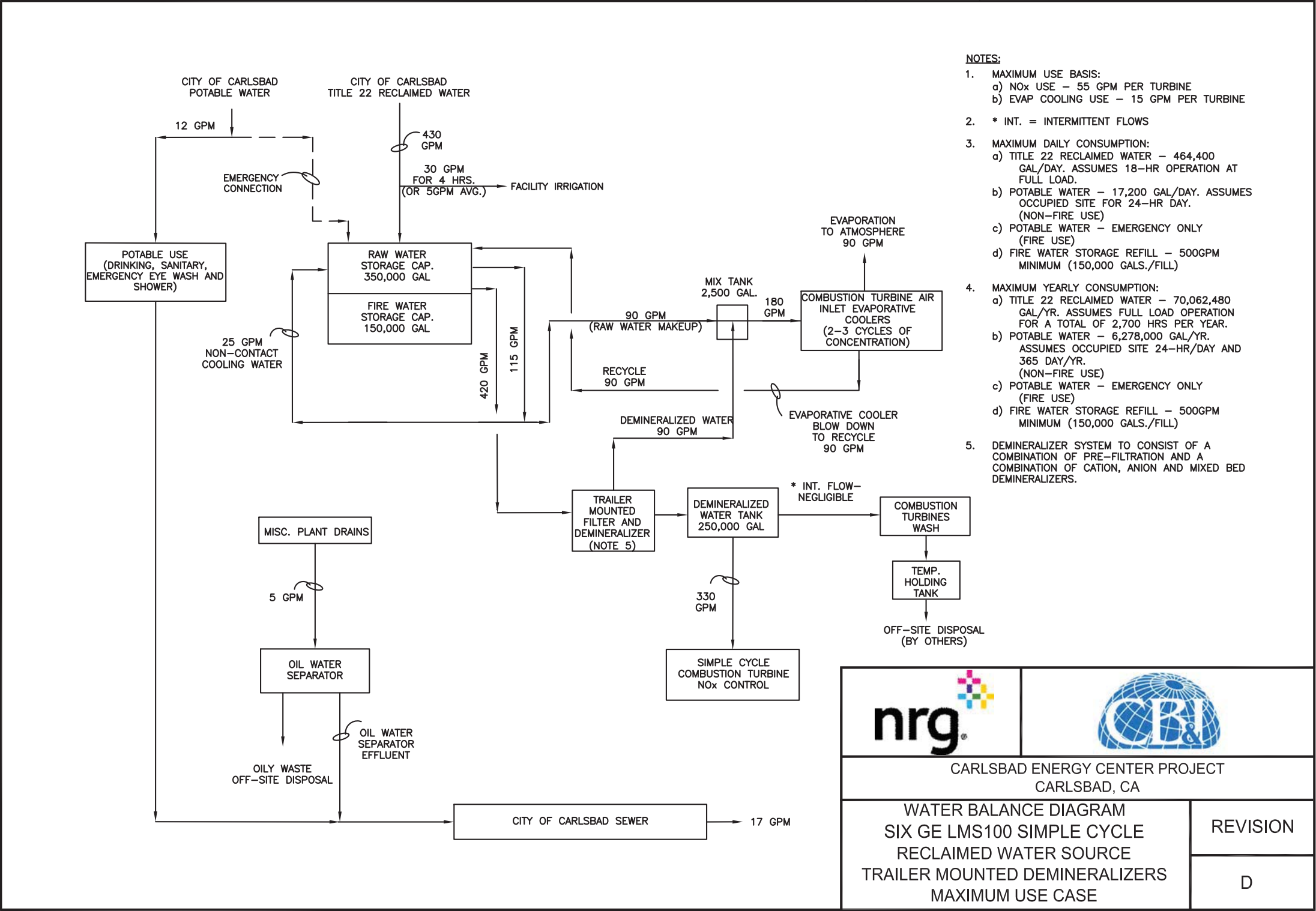


FIGURE DR 86-1
Water Balance Diagram
Maximum Use Case
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

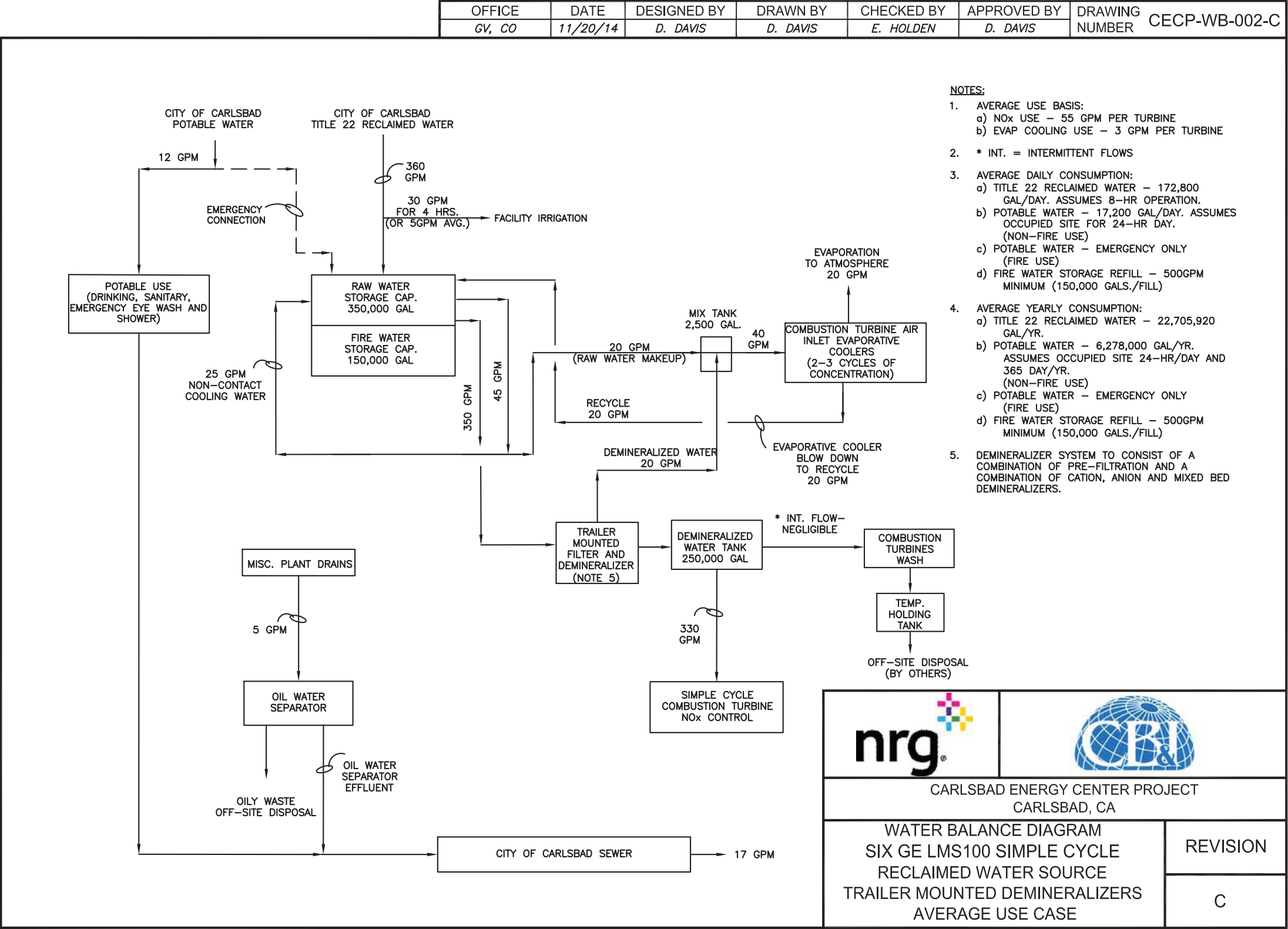
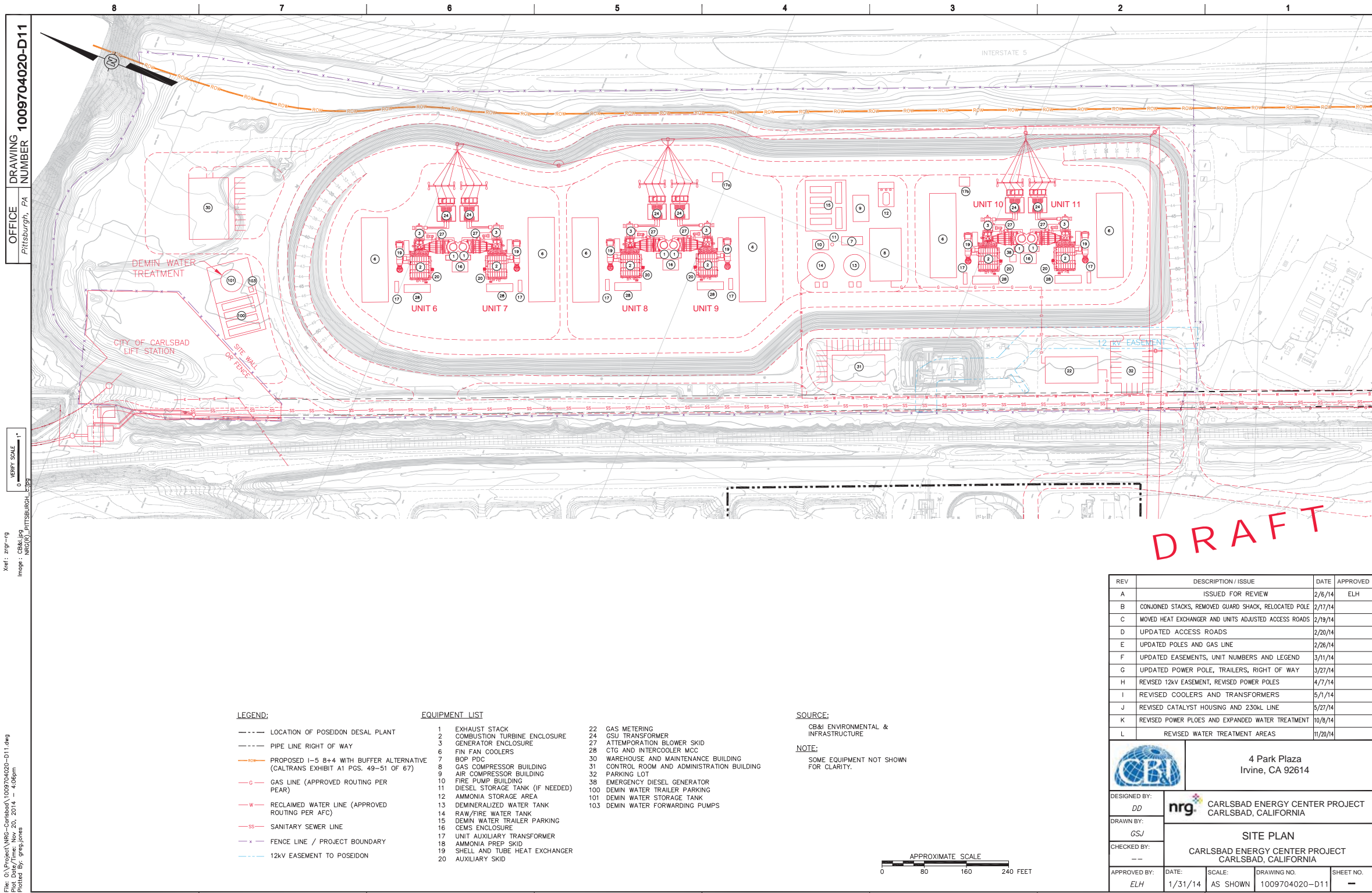


FIGURE DR 86-2
Water Balance Diagram
Average Use Case
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend



REV	DESCRIPTION / ISSUE	DATE	APPROVED
A	ISSUED FOR REVIEW	2/6/14	ELH
B	CONJOINED STACKS, REMOVED GUARD SHACK, RELOCATED POLE	2/17/14	
C	MOVED HEAT EXCHANGER AND UNITS ADJUSTED ACCESS ROADS	2/19/14	
D	UPDATED ACCESS ROADS	2/20/14	
E	UPDATED POLES AND GAS LINE	2/26/14	
F	UPDATED EASEMENTS, UNIT NUMBERS AND LEGEND	3/11/14	
G	UPDATED POWER POLE, TRAILERS, RIGHT OF WAY	3/27/14	
H	REVISED 12KV EASEMENT, REVISED POWER POLES	4/7/14	
I	REVISED COOLERS AND TRANSFORMERS	5/1/14	
J	REVISED CATALYST HOUSING AND 230KV LINE	5/27/14	
K	REVISED POWER PLOES AND EXPANDED WATER TREATMENT	10/8/14	
L	REVISED WATER TREATMENT AREAS	11/20/14	



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DESIGNED BY: DD	 CARLSBAD ENERGY CENTER PROJECT CARLSBAD, CALIFORNIA			
DRAWN BY: GSJ				
CHECKED BY: ---				
APPROVED BY: ELH	DATE: 1/31/14	SCALE: AS SHOWN	DRAWING NO. 1009704020-D11	SHEET NO. —

FIGURE 2.0-1R
Site Plan
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

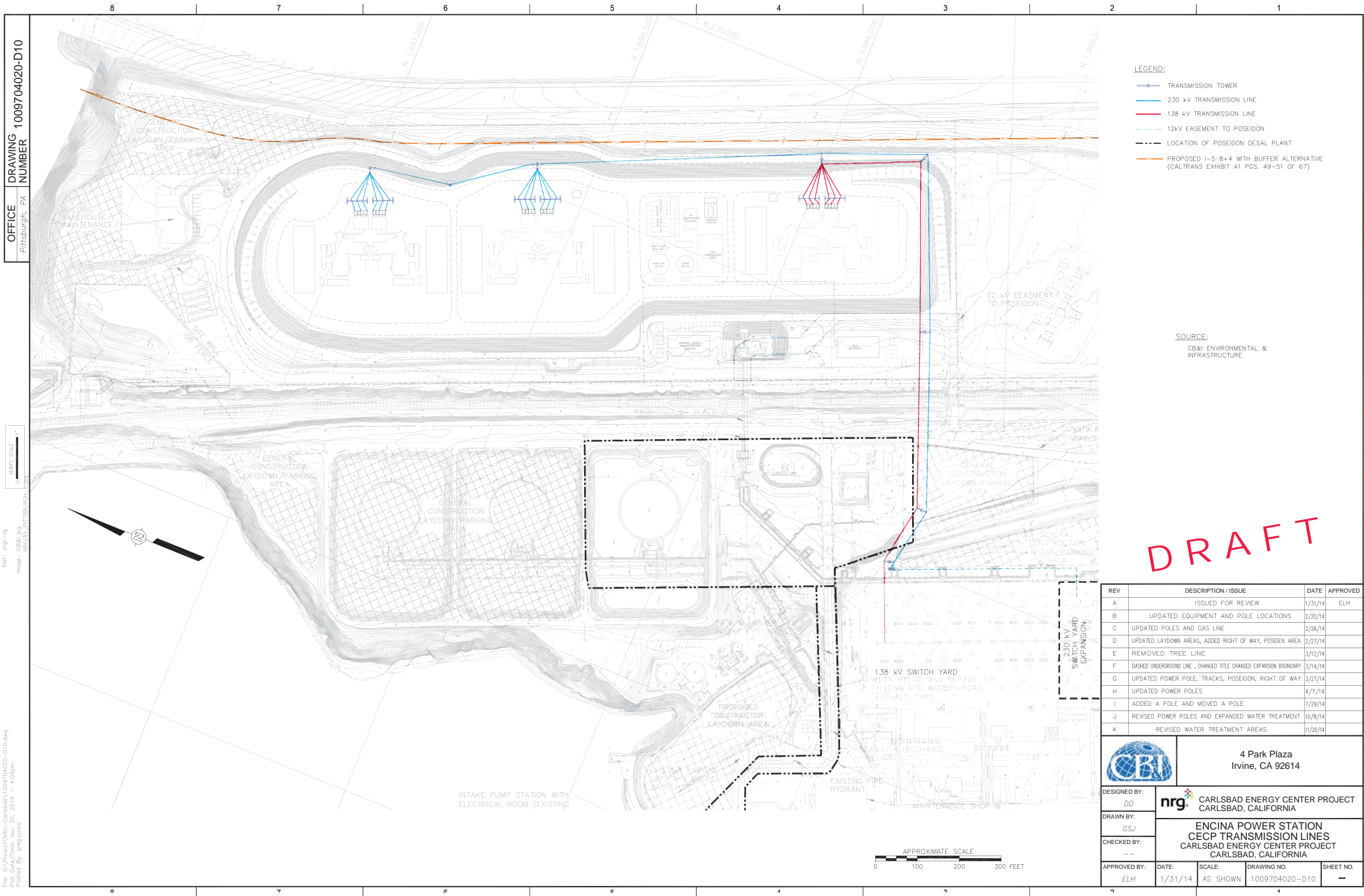


FIGURE 3.1-1R
Transmission Lines
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend

Transmission System Engineering (91–92)

BACKGROUND: ONE-LINE DIAGRAM OF THE PROPOSED SWITCHYARDS

Since the proposed project would consist of three separate switchyards (two 230/13.8 kV switchyards for the proposed units 6 & 7, and units 8 & 9; one 138/13.8 kV switchyard for the proposed units 10 & 11), the submitted switchyard one-line diagram Figure DR21-1 does not include complete electrical one-line diagrams of the switchyards. It is standard industry practice to locate circuit breakers with associated disconnect switches on either end of a generator (gen) tie line for protection of the gen line. The provided diagrams do not depict any circuit breaker with associated disconnect switches for the outgoing gen tie line at the switchyard 230 kV/138 kV buses. (Data Response to TSE data request set 1, dated August 15, 2014: tn202938).

DATA REQUEST

91. Resubmit Figure DR21-1 and provide complete electrical one-line diagrams for each of the three switchyards with additional information. The diagrams should show all equipment for the interconnection facilities within the three switchyards including length sizes and/or ratings which match the individual MVA rating of each gen unit or two gen units together where applicable, as follows:
- a. Any bus duct connectors or cables between each gen unit and the low side of each gen step-up transformer (GSU), or between each gen unit and the 13.8/15 kV switchgear buses, breakers, and disconnect switches up to the low side of each gen step-up transformer (GSU);
 - b. The GSU transformers with revised ratings (currently each GSU transformer rating appears to be underrated, shown as 76/101/127 MVA) based on each generator 155 MVA, 13.8 kV ratings (maximum generation MW output 131.8 MW @ 0.85 power factor as stated in your response) including percentage impedance of the revised GSU transformers based on its new base MVA rating.
 - c. Any bus duct connectors or short overhead conductors/cables from the high side of the GSU transformer to the respective switchyard 230 kV/138 kV buses including 230 kV/138 kV breakers and associated disconnect switches.
 - d. Provide the ampere ratings of the 230 kV and 138 kV switchyard busses, if any.

Response:

Figure DR21-1 is provided herein with the requested data in DR 91a-d.

BACKGROUND: TERMINATION OF THE CEC 230 KV GEN TIE LIN AT THE SDG&E KV SWITCHYARDS

The termination point of the CEC 230 kV gen tie line has not been specifically described. Applicant's September 19, 2014 Set 1 Data Responses (to DR no. 28) indicated "In the 230 kV portion of the Encina switchyard, SDG&E will take necessary actions to ensure that a breaker position is available for the new 230 kV line from the CEC amendment, thereby preventing interference with the existing EPS unit connections." However, it is necessary for the CEC to know the specific point of interconnection details (at least tentative) in order to complete the TSE PSA (Data Response to TSE data request set 1, dated Sept. 19, 2014)

DATA REQUEST

92 .Describe the proposed actions/modifications that would be required by SDG&E to make space for a switching bay position for terminating the CECP 230 kV gen tie line, and please resubmit Figure DR28-4 (the post-project one line diagram of SDG&E 230 kV switchyard showing the new switching bay no. with installations such as additional breaker(s) with associated disconnect switches etc. with their ratings), and depict the intended actions/modifications necessary for the switchyard to accommodate the incoming amended CECP 230 kV gen tie line.

Response:

The current space located within the SDGE 230kV switchyard is open as shown in previously submitted Figure DR29-1, Data Set 1.

SDG&E will be installing two 230kV breakers (3E, 3T) and two 230kV switches and associated bus work to accommodate the CECP interconnection within the switchyard. There is no switching of any bay positions needed within the SDG&E 230kV switchyard to accommodate the new CECP 230kV line.

Figure 28-4R is provided herein with the section highlighted as to the location that CECP will be interconnected within SDG&E 230kV switchyard.

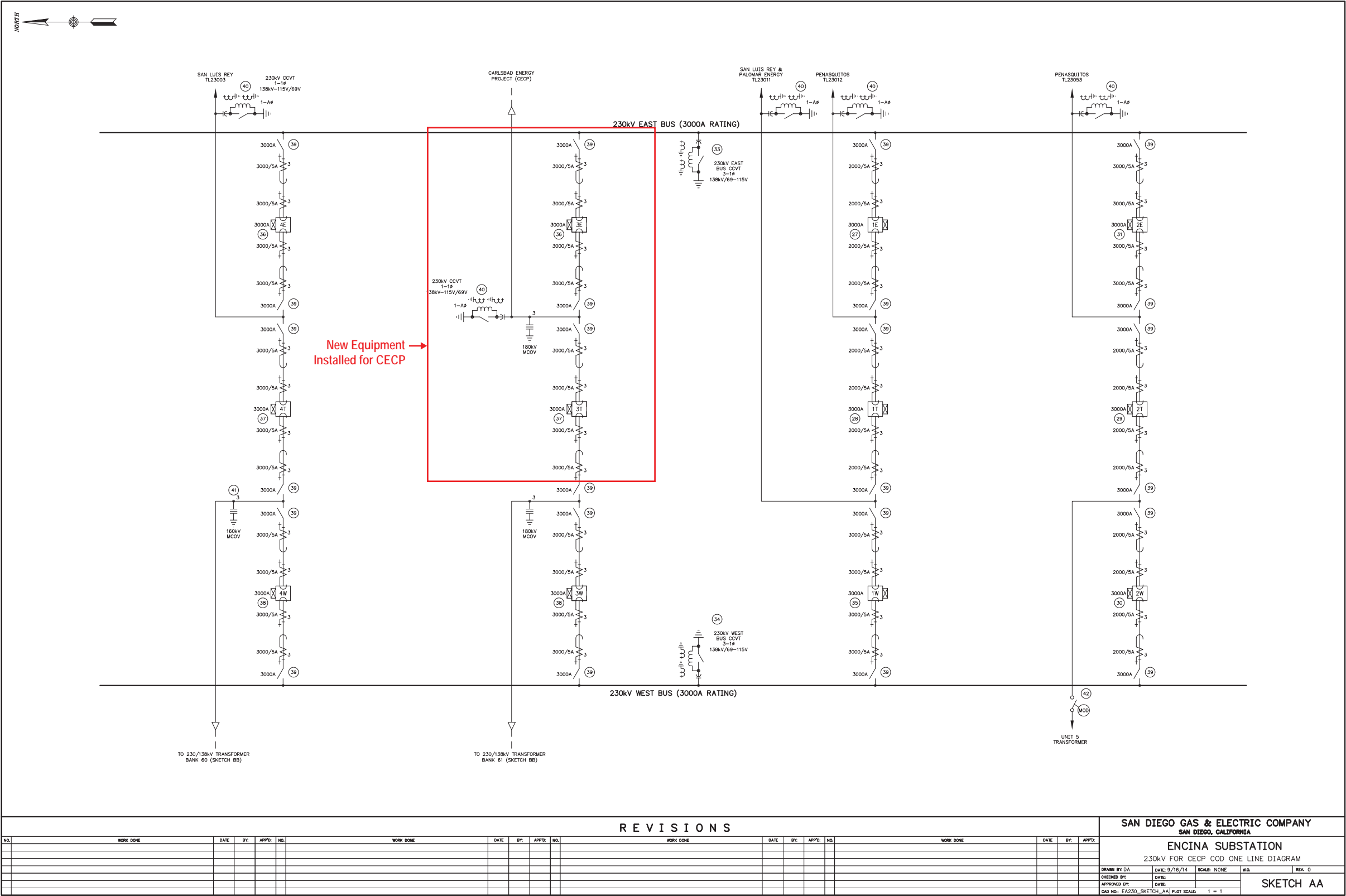


FIGURE DR28-4R1
One Line Diagram
Carlsbad Energy Center Project
Carlsbad, California (07-AFC-06C)
Petition to Amend