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April 18, 2014

Ms. Felicia Miller, Siting Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, California 95814

Re: Huntington Beach Energy Project (12-AFC-02)
Applicant's Follow-Up to PSA Part B Workshop - Part 1 of 2
Biological Resources & Alternatives/Soil & Water Resources

Dear Ms. Miller:

As discussed during the April 3, 2014 Preliminary Staff Assessment (PSA) Part B Workshop, Applicant herein provides the following information in two technical areas: Biological Resources and Alternatives/Soil & Water Resources. Information regarding Air Quality will be docketed separately, on or before April 22, 2014.

I. BIOLOGICAL RESOURCES

During the recent workshop Staff explained that they understood the variable nature of construction noise and were primarily concerned with the potential for the loudest construction sources, primarily pile driving activities, to disturb wildlife on a persistent and routine basis. Staff explained that unlike people for which the Noise conditions of certification establish a complaint resolution process, a similar complaint-based process is not possible for addressing potential disturbance to wildlife. To reduce the potential for continuous disturbance, Staff and Applicant agreed to establish a construction noise action level which, when repeatedly exceeded, would trigger a requirement for Applicant to consider and implement additional construction noise reduction measures. Applicant previously described several measures available to reduce pile driving noise. (*See Applicant's Comments on the Preliminary Staff Assessment (Part A)* at p. 29 (Nov. 7, 2013) (TN# 201142).) Such measures include: (1) the use of pads, (2) the use of dampers and (3) the use of a vibratory method of pile driving. In addition to these measures, temporary construction noise barriers along the fence line or closer to the construction activity

may provide additional reductions. The deployment of these measures is expected to result in a noticeable reduction in sound levels.

Although Applicant does not concur that HBEP's construction noise poses a significant impact to wildlife, Applicant proposes the following modification to Staff's proposed Condition of Certification BIO-8 to address Staff's concerns about construction noise. Note that BIO-8, below, is consistent with the *Huntington Beach Energy Project (12-AFC-02) Applicant's Comments on the Preliminary Staff Assessment (Part A),* with additional proposed changes in bold underline and strikeout.

> **BIO-8** Pre-construction nest surveys shall be conducted if construction activities will occur from February 1 through August 31. The Designated Biologist or Biological Monitor shall perform surveys in accordance with the following guidelines:
> 1. Surveys shall cover all potential nesting habitat within a 100-foot buffer of the project site and areas surrounding the project site.
>
> 2. One pre-construction survey will be conducted within 14 days before construction is initiated.
>
> 3. If active nests are detected during the survey, a no-disturbance buffer zone (protected area surrounding the nest) of 100 feet shall be established for all non-raptor species and 500 feet for any raptors shall be established around each nest. The buffer sizes will be confirmed by the Designated Biologist in consultation with the CPM (in coordination with CDFW and USFWS). Nest locations shall be mapped using GPS technology and submitted, along with a weekly report stating the survey results, to the CPM in the monthly compliance reports.
>
> 4. The Designated Biologist or Biological Monitor shall monitor all nests with buffers at least once per week, to determine whether birds are being disturbed. If signs of disturbance or distress are observed, the Designated Biologist or Biological Monitor shall immediately implement adaptive measures to reduce disturbance. These measures could include, but are not limited to, increasing buffer size, halting disruptive construction activities in

the vicinity of the nest until fledging is confirmed, or placement of visual screens or sound dampening structures between the nest and construction activity.

5. The Biological Monitor shall monitor the nest until he or she determines that nestlings have fledged and dispersed or the nest is no longer active. ~~Activities that might, in the opinion of the Designated Biologist, disturb nesting activities (e.g., excessive noise above ambient levels or 60 dBA in areas where pre-construction noise levels were below 60 dBA, exposure to exhaust), shall be prohibited within the buffer zone until such a determination is made.~~

6. If periodic construction sound monitoring indicates that project-related sound levels in the Magnolia Marsh from February 1 through August 31 are anticipated to exceed the greater of: (1) the existing hourly Leq plus 8 dBA; or (2) an hourly Leq of 60 dBA for six (6) hours per day for five (5) or more continuous days during pile driving activities and pile driving is anticipated to occur for 30 or more days, additional pile driving noise reduction measures shall be implemented. Pile driving noise reduction measures could consist of (1) the use of pads, (2) the use of dampers, (3) if practicable, the use of vibratory pile driving, (4) temporary construction noise barrier either along the fence line or closer to the equipment or (5) other measures approved by the CPM.

Verification: Prior to the start of any pre-construction site mobilization, the project owner shall provide the CPM a letter-report describing the findings of the preconstruction nest surveys, including the time, date, and duration of the survey; identity and qualifications of the surveyor(s); and a list of species observed. If active nests are detected during the survey, the report shall include a map or aerial photo identifying the location of the nest and shall depict the boundaries of the no disturbance buffer zone around the nest, and a monitoring plan shall be submitted to the CPM for review and approval. Additional copies shall be provided to the

CDFW and USFWS for review and comment. Approval of the plan is required before construction may commence. All impact avoidance and minimization measures related to nesting birds shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the monthly compliance reports by the Designated Biologist.

At least fourteen (14) days prior to the start of production pile driving, a wildlife noise monitoring protocol will be submitted to the CPM that outlines the pile driving noise monitoring plan. Sound monitoring will initially be necessary over a period of two (2) days as piling activities commence and monitoring will be repeated when piling activities move closer to the Magnolia Marsh or as otherwise approved by the CPM. If required, pile driving noise reduction measures shall be implemented within 14 days or as otherwise approved by the CPM.

II. ALTERNATIVES/WATER RESOURCES

During the recent workshop, Applicant presented preliminary cost information for an alternative water supply system using secondary effluent from Orange County Sanitation District (OCSD) Plant No. 2. The information exchange was in response to Staff's presentation of a "Recycled Water Supply Alternative" in PSA Part B. Information presented by Applicant at the workshop and in subsequent correspondence was based on preliminary information developed earlier during the project review period; the information presented in this letter has been further refined and updated. In addition, two related items were raised at the workshop: (1) the potential for pipeline construction along State Route 1 (Pacific Coast Highway, or PCH), and (2) the comparative costs of the secondary effluent water system compared to the proposed potable water system. These items also are addressed in this letter. Based on the information presented at the workshop, in this letter, and in prior correspondence, Applicant reaffirms its position that recycled water is not available to serve HBEP and the use of such water at HBEP is not feasible, is economically unsound, and is unreasonable.

Table 1 below summarizes the capital and operating costs associated with both the treatment and conveyance system (two optional pipeline alignments). Additional detail is provided in the text and tables that follow. Total annual costs for the secondary effluent water system range from

approximately $1,540,000 to $1,762,000. For comparison, potable water from the City of Huntington Beach is estimated to cost approximately $116,000 per year.

Table 1
Total Costs

	Channel Alignment	**PCH Alignment**
CAPITAL COST		
Total Conveyance Capital Cost	$4,983,000	$7,934,000
Total Treatment Capital Cost	$13,896,000	$13,896,000
Total Capital Cost	$18,879,000	$21,830,000
Total Annualized Capital Cost, $/year	$1,229,000	$1,421,000
O&M COST		
Total Conveyance O&M Cost, $/year	$90,000	$120,000
Total Treatment O&M Cost, $/year	$220,785	$220,785
Total Annual O&M Cost, $/year	$310,785	$340,785
Total Annual Cost, $/year	**$1,539,785**	**$1,761,785**
Discount Rate	5%	5%
Period	30 years	30 years

Conveyance Costs

A Recycled Water Supply Alternative would require a pipeline to convey secondary treated effluent from OCSD Plant No. 2 to the HBEP site. The applicant studied two potential pipeline alignments: (1) the Channel Alignment, which follows the Talbert Channel and Huntington Beach Channel along the north side of Brookhurst Marsh and Magnolia Marsh, and (2) the PCH Alignment, which follows the San Gabriel River Trail, PCH, and Newland Street. At 1.4 miles, the Channel Alignment is the most direct route between OCSD Plant No. 2 and the HBEP site. The PCH Alignment is slightly longer at 2.1 miles. Alignments suggested by Staff in PSA Part B may not be feasible for the reasons stated by a representative from the City of Huntington Beach at the workshop – there is limited room in city streets for additional utilities. For this reason, Staff's suggested alignments were not studied further.

Various constraints may limit the feasibility of both the Channel Alignment and the PCH Alignment. The Channel Alignment, which would be constructed along channel maintenance access roads, would be constructed in close proximity to Brookhurst Marsh and Magnolia Marsh.

Trenchless construction (e.g., horizontal directional drilling) would be required for at least one channel crossing. Construction along PCH would require lane closure, which would likely occur at night given the regional importance of this six-lane divided highway. The City of Huntington Beach has indicated that activities resulting in construction within PCH would likely result in the City requiring additional improvements to bring this portion of PCH up to current standards. While the details of such improvements are currently unknown, this would further increase the impacts of construction and result in additional costs.

Table 2 presents the capital and operating costs of both alignment options, based on the use of 8-inch ductile iron pipe to convey the required flows to HBEP. It should be noted that cost estimates remain preliminary in nature – materials and installation costs are included, but the estimate does not include freight and delivery, permitting, legal fees, land acquisition, or inflation and other market adjustments.

Table 2
Cost Estimate to Convey OCSD Plant No. 2 Secondary Effluent to HBEP

	Channel Alignment	**PCH Alignment**
Design Flow (mgd)[1]	1.2	1.2
Pipeline Length (feet)	7,392	10,982
Capital Cost		
Sitework	$360,000	$360,000
Pressure Pipeline[2]	$1,848,000	$3,370,000
Vertical Turbine Pump Station[3]	$360,000	$360,000
Subtotal	**$2,568,000**	**$4,090,000**
Mobilization (15%)	$386,000	$614,000
Bonds and Insurance (6%)	$155,000	$246,000
Contractor's Overhead (12%)	$309,000	$491,000
Contractor's Profit (8%)	$206,000	$328,000
Subtotal	**$3,624,000**	**$5,769,000**
Contingency (25%)	$906,000	$1,443,000
Subtotal	**$4,530,000**	**$7,212,000**
Design, Engineering and Admin Fees (10%)	$453,000	$722,000
Total Capital Cost	**$4,983,000**	**$7,934,000**
O&M Cost		
Power[4] (one pump + standby)	$40,000	$40,000

Maintenance (1% of the Capital Cost), $/year	$50,000	$80,000
Total O&M Cost, $/year	**$90,000**	**$120,000**
30-Year LCC, $	**$6,367,000**	**$9,779,000**
Discount Rate	5%	5%
Period	30 years	30 years

Cost Estimate Assumptions:

[1]Assumes wastewater effluent available 24/7 and power plant demand 24/7 to achieve continuous flow without storage; assumes fixed flow equal to the average flow unless flow will be equalized prior to flow conveyance. Nominal volume of booster pumping forebay represents about one hour detention time at design flow.

[2] Pressure pipeline cost estimate based on 8-inch ductile iron pipeline with cement mortar lining and polyethylene encasement coating. Assumes a Hazen Williams Coefficient of C=120 and a pumping headloss of 6 feet per 1000 feet of length. Assumes 3 air valves per mile, 1 blowoff valve per mile, and 1 in-line valve per mile to facilitate filling and dewatering. Includes adjustment factor for substantial increased costs for channel crossings as well as a generic allowance factor for trench dewatering given the proximity of each facility to the coast and coastal groundwater basins. For PCH alignment (approximately 2.08 miles of pavement), additional adjustments include OCFCD bike path replacement, Caltrans structural paving replacement, Caltrans bridge crossing, utility relocations, and traffic control.

[3] Pump station estimate based on a vertical turbine high service pump station. Assumes all pumps will be equal size and assumes a buried rectangular forebay, with the pump station installed at grade on top of the forebay.

[4] Electricity unit cost is $0.12/kWh. Based on one 50hp pumps at OCSD Plant #2.

Treatment Costs

Delivery of secondary effluent to HBEP will require additional treatment that would not be required for potable water. For the volume and quality of water required for HBEP operations, the Applicant estimates that membrane filtration (MF), reverse osmosis (RO), and ultraviolet (UV) disinfection processes would be required. Unlike the proposed potable water system, the proposed MF and RO backwash systems would generate wastes that could not be discharged to the ocean; therefore, the costs of the secondary effluent treatment system includes City of Huntington Beach sewer connection and surcharge fees. Table 3 presents the estimated capital and installation costs for the secondary effluent treatment system, and Table 4 presents the estimated annual operating costs.

Table 3
Capital Cost Estimate to Treat OCSD Plant No. 2 Secondary Effluent at HBEP

Item	Value
Sitework	$41,000
Concrete	$173,000
Canopy	$306,000
Equipment	$3,956,000
Instrumentation and Control	$364,000
Mechanical	$401,000
Electrical	$487,000
Subtotal	$5,728,000
Break Tanks, Interstage Connections and Interstage Pumping (15% of the Subtotal)	$860,000
Plant SCADA and Computer (10 % of the Subtotal)	$573,000
Subtotal	**$7,161,000**
Contractor Markups	
Mobilization (15%)	$1,075,000
Bonds and Insurance (6%)	$430,000
Contractor's Overhead (12%)	$860,000
Contractor's Profit (8%)	$573,000
Subtotal with the Contractor Markups	**$10,099,000**
Project Contingency, 25% of the Subtotal with Markups	$2,525,000
Subtotal with Contingency	**$12,624,000**
Design, Engineering and Admin Fees, 10 % of the Total Construction Cost	$1,263,000
Subtotal with Contingency	**$13,887,000**
Sewer Connection Fee	$9,000
TOTAL CAPITAL COST	**$13,896,000**

Table 3 Notes:
Cost estimates for the technology alternatives will be developed by obtaining budgetary-level equipment costs from equipment suppliers and calculating facility costs using CH2M HILL's cost-estimating methodology (CPES) for projects of similar type and size. The cost estimates developed for this analysis provide a relative comparison of the treatment alternatives and are considered order-of-magnitude estimates. An order-of-magnitude cost estimate is defined as "an approximate estimate made without detailed engineering data." The Association for the Advancement of Cost Engineering (AACE)

International defines order-of-magnitude costs as Class 5 cost estimates without detailed engineering data. Examples of order-of-magnitude costs include an estimate from cost capacity curves, an estimate using scale-up or scale-down factors, and an approximate ratio estimate. The estimates shown, and any resulting conclusions on project financial or economic feasibility or funding requirements, have been prepared to guide project evaluation and implementation from the information available at the time of cost estimation. The expected accuracy ranges for a Class 5 cost estimate are -15 to -30 percent on the low side and +20 to +50 percent on the high side. The final costs of the project and resulting feasibility will depend on actual labor and material costs, competitive market conditions, actual site conditions, final project scope, implementation schedule, continuity of personnel and engineering, and other variables.
Capital costs do not include factors for market adjustment, escalation during construction, land acquisition, legal and permitting fees
Capital cost includes MF, RO, UV disinfection, chemical feed and storage facilities, break tanks and interstage piping
The system is designed to reduce ammonia-N and TOC content similar to potable water to minimize corrosion and biogrowth issues.
MF/RO/UV Disinfection units are sized to handle peak flow with a 0.90 on-line factor
MF system cost is based on packaged MF systems provided by Pall Inc. It should be noted that other approved membrane filtration technologies supplied by Siemens, GE, Toray, Hydranautics, H2O Engineering, Dow, BASF Inge and others are also qualified.
RO system cost is based on packaged RO systems provided by GE. Other packaged RO systems supplied by Siemens, H2O Engineering, TONKA and others are also qualified.
UV Disinfection system cost is based on in pipe UV system provided by Trojan. Other UV disinfection systems supplied by Calgon, Xylem and others are also qualified.
MF and RO design recoveries are 90 and 85%, respectively.
MF backwash wastes and neutralized CIP wastes from MF and RO are discharged to the sewer.
RO concentrate is discharged to the ocean using the existing outfall.
All numbers are rounded to the nearest 1000s.

Table 4
O&M Cost Estimate to Treat OCSD Plant No. 2 Secondary Effluent at HBEP

Item	**Value**
Power, $/year	$55,000
Consumables (membranes, UV lamps and sleeves, etc.) , $/year	$59,000
Chemicals, $/year	$34,000
Maintenance, $/year	72,000$
Subtotal, $/year	**$220,000**
Sewer Surcharge Fee, $/year	$785
Total O&M Cost, $/year	**$220,785**

Table 4 Notes:
O&M cost is based on annual average flow of 0.18 mgd

The facility operates 6,651 hours per year
Power unit cost is $0.12/kWh
All chemical costs are based on values provided by local suppliers. The chemicals include sodium hypochlorite, citric acid, antiscalant, sulfuric acid, sodium bisulfite and caustic.
Chlorine is added to MF feed to form chloramines to protect MF and RO membranes against biological fouling.
Antiscalant and sulfuric acid are continuously dosed to RO feed water for scale control
MF membrane replacement frequency is every 10 years.
RO membrane replacement frequency is every 5 years
UV lamp replacement frequency is every 12,000 hours.
No additional staff is needed to operate and maintain the facilities
MF backwash wastes and neutralized CIP wastes from MF and RO are discharged to the sewer.
RO concentrate is discharged to the ocean using the existing outfall.
All numbers are rounded to the nearest 1000s.

The capital facilities costs and O&M costs of the secondary effluent treatment system are not required for the proposed potable water system. The potable water system simply requires payment of a monthly meter fee ($43.22 for an 8-inch connection) and per-unit usage costs ($1.75 per unit). Based on maximum annual average water use of 134 acre-feet per year (241 "units"), total annual water cost is estimated to be $116,000 per year. Thus, the costs for average annual water use for projected operations would be significantly less based on lower water consumption.

As explained in detail herein and during the April 3 workshop, the costs associated with the treatment and conveyance system related to the use of secondary treated effluent from OCSD Plant No. 2 clearly render the use of such alternate water source at HBEP economically unsound and infeasible.[1] Recycled water is not "available" for HBEP nor is the cost of furnishing recycled water to HBEP comparable to, or less than, the cost of supplying potable water to the Project. The use of potable water at HBEP is consistent with LORS, and will have a net beneficial impact on local water supplies.

[1] Applicant reiterates and incorporates herein its previous comments on this topic that provide further support that the use of an alternate water source is not feasible at HBEP. (*See Applicant's Comments on Staff's Supplemental Focused Analysis, PSA, Part A*, dated January 21, 2014 and *Applicant's Comments on Preliminary Staff Assessment, Part B*, dated April 7, 2014 (TN# 201582 and 201969, respectively).)

III. CONCLUSION

Applicant is fully invested in HBEP and eager to obtain a Final Decision and license to construct and operate this project, which is critical to maintaining electrical system reliability in southern California. Applicant looks forward to Staff's prompt publication of the Final Staff Assessment.

Respectfully submitted,

Melissa A. Foster

MAF:jmw