

OEHI Response to CEC Follow-Up Questions Regarding Workshop Request A41 (CEC Data Request A38)

Amended Application for Certification
for
HYDROGEN ENERGY CALIFORNIA
(08-AFC-8A)
Kern County, California

February 2013

Occidental of Elk Hills, Inc.

California Energy Commission (CEC)

Data Request A38

February 2013

Mike Kelly
Vector Environmental, Inc.

CEC Data Request A38

William Walters email 1-29-12. In reviewing the workshop data response submittal received today we are seeing a problem with Tables 1.D and 2.D. The well maintenance rows on both tables are showing a total CO₂e value that isn't the sum of the values for CO₂, N₂O, CH₄ and the those three values are different than they were presented before for the 552 MMSCFD case. Unless you identify why the older values changed and that the summed value is incorrect, we plan on using the older values and use the multiplier to determine the correct 685 MMSCFD case values.

Response: (Greenhouse Gas Emission Calculations)

Per Workshop Request A39-A42, the greenhouse gas (GHG) emissions summarized in Tables 1C and 1D (552 MMSCFD design case) and Tables 1C and 1D (685 MMSCFD design case) were reviewed. The value reported in the Table 1C and 1D for carbon dioxide emission (CO₂) from well maintenance was input to the table incorrectly. Tables 2C and 2D were propagated from Tables 1C and 1D therefore they contain a similar error.

The incorrect CO₂ value listed for well maintenance in Table 1D (386 Tonne/year) was not used in the emission calculations. The erroneous data in the table has been corrected. Corrected tables are attached. The changes result in:

- an increase in CO₂e emission of 0.59 tonne/day for the 552 MMScf/day case (Table 1C);
- an increase in CO₂e emission of 0.73 tonne/day for the 685 MMScf/day case (Table 2C);
- no change in the CO₂e emissions reported in Table 1D or Table 2D.

One additional question. While the 685 MMSCFD case provides the maximum recycle case, what would be a reasonable multiplier for project average recycle rate to determine the long-term project average emissions (for direct GHG emissions analysis purposes only).

Response

OEHI recommends using the 685 MMSCFD case to determine the long-term emissions.

Attachment-I

Design Case of 522 MMScfd

Greenhouse Gas Emissions

Table-1.C
Maximum Daily Emissions of Greenhouse Gases

Design Basis 552 MMScfd				
Equipment Description and Process Information	Carbon Dioxide CO ₂ e Tonne/Day	Methane CH ₄ as CO ₂ e Tonne/Day	Nitrous Oxide N ₂ O as CO ₂ e Tonne/Day	Total CO ₂ e Tonne/Day
Stationary Source	27,652.36	3.02	4.31	27,659.69
Indirect (Electric Power)	-----	-----	-----	493.63
Well Maintenance	1.06	0.00	0.00	1.06
Mobile Source	0.45	0.00	0.00	0.46
Total GHG Emissions	27,653.87	3.02	4.31	28,154.84
Note: 1. Maximum daily emissions from stationary source equipment were calculated using the maximum rated capacity of the equipment assuming a 24 hour per day operating schedule at 100% load. 2. The maximum daily emissions from well maintenance activities were calculated by dividing the emission for year 2034 by the number of days of well maintenance conducted during the year (150 days per year). 3. Per the San Joaquin Valley Air Pollution Control District calculation procedures, maximum daily emissions from emergency use only stationary source equipment include the potential emissions that could result from a 24 hour emergency event. 4. The maximum daily emissions from mobile source activity were estimated by dividing the annual emission by 365.				

Table-1.D
Annual Emissions of Greenhouse Gases

Design Basis 552 MMScfd				
Equipment Description and Process Information	Carbon Dioxide CO ₂ e Tonne/Year	Methane CH ₄ as CO ₂ e Tonne/Year	Nitrous Oxide N ₂ O as CO ₂ e Tonne/Year	Total CO ₂ e Tonne/Year
Stationary Source	46,132.35	156.53	23.29	46,312.17
Indirect (Electric Power)	-----	-----	-----	180,176.63
Well Maintenance	172.86	0.14	0.44	173.44
Mobile Source	165.07	0.17	1.53	166.77
Total GHG Emissions	46,470.28	156.38	25.26	226,829.01
Annual average emissions over the life of the project.				

Attachment-II

Design Case of 685 MMScfd

Greenhouse Gas Emissions

Criteria Pollutant Emissions (685 MMScfd Design Basis)

Table-2.C
Maximum Daily Emissions of Greenhouse Gases

Design Basis 685 MMScfd				
Equipment Description and Process Information	Carbon Dioxide CO ₂ e Tonne/Day	Methane CH ₄ as CO ₂ e Tonne/Day	Nitrous Oxide N ₂ O as CO ₂ e Tonne/Day	Total CO ₂ e Tonne/Day
Stationary Source	34,314.97	3.74	5.34	34,324.06
Indirect (Electric Power)	-----	-----	-----	612.57
Well Maintenance	1.32	0.00	0.00	1.32
Mobile Source	0.56	0.00	0.01	0.57
Total GHG Emissions	34,316.85	3.74	5.36	34,938.52
<p>Note:</p> <p>1. Greenhouse gas emissions from equipment and indirect GHG emissions from electric power consumption were calculated for the 685 MMScfd design case using a proration factor of 1.2409 (= 685/552). For additional information on the calculation procedures refer to the notes included in Table-2.A found in Attachment-I.</p>				

Table-2.D
Annual Emissions of Greenhouse Gas Emissions

Design Basis 685 MMScfd				
Equipment Description and Process Information	Carbon Dioxide CO ₂ e Tonne/Year	Methane CH ₄ as CO ₂ e Tonne/Year	Nitrous Oxide N ₂ O as CO ₂ e Tonne/Year	Total CO ₂ e Tonne/Year
Stationary Source	57,247.57	194.25	28.90	57,470.72
Indirect (Electric Power)	-----	-----	-----	223,588.76
Well Maintenance	214.51	0.17	0.55	215.23
Mobile Source	204.84	0.22	1.90	206.96
Total GHG Emissions	57,666.92	194.64	31.35	281,481.67
<p>Note:</p> <p>1. Greenhouse gas emissions from equipment and indirect GHG emissions from electric power consumption were calculated for the 685 MMScfd design case using a proration factor of 1.2409 (= 685/552). For additional information on the calculation procedures refer to the notes included in Table-2.B found in Attachment-I. Annual average emissions over the life of the project.</p>				



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**AMENDED APPLICATION FOR CERTIFICATION
FOR THE HYDROGEN ENERGY
CALIFORNIA PROJECT**

**Docket No. 08-AFC-08A
PROOF OF SERVICE
(Revised 2/11/13)**

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DECLARATION OF SERVICE

I, Dale Shileikis, declare that on February 11, 2013, I served and filed copies of the attached OEHI Response to CEC Follow-Up Questions Regarding Workshop Request A41 (CEC Data Request A38), dated February, 2013. This document is accompanied by the most recent Proof of Service, which I copied from the web page for this project at: http://www.energy.ca.gov/sitingcases/hydrogen_energy/.

The document has been sent to the other persons on the Service List above in the following manner:

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For service to all other parties and filing with the Docket Unit at the Energy Commission:

 X I e-mailed the document to all e-mail addresses on the Service List above and personally delivered it or deposited it in the US mail with first class postage to those persons noted above as "hard copy required";
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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am over the age of 18 years.

Dated: 2/11/13


