

US EPA ARCHIVE DOCUMENT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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October 24, 2013

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John Heiser
California Energy Commission
Dockets Unit, MS-14
Docket No. 8-AFC-8A
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Preliminary Staff Assessment/Draft Environmental Impact Statement, Hydrogen Energy California Project (HECA), Kern County, California (CEQ # 20130210)

Dear Mr. Pozzuto and Mr. Heiser:

The U.S. Environmental Protection Agency (EPA) has reviewed the above-referenced document pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. Our detailed comments are enclosed.

The Preliminary Staff Assessment/Draft Environmental Impact Statement assesses the impacts from construction and operation of the Hydrogen Energy California Project. The California Energy Commission is responsible for reviewing and ultimately approving or denying all applications needed to construct and operate the power plant, and for preparing the Staff Assessment pursuant to the California Environmental Quality Act. The federal action under NEPA that requires an Environmental Impact Statement is the Department of Energy's decision whether to provide approximately \$408 million in financial assistance to the applicant. We commend the CEC and DOE for addressing the State and Federal impact assessment requirements in a combined PSA/DEIS. While this approach presented challenges for the agencies due to the differences between the State and federal timelines and procedures, it simplifies the review process for the public. We note that CEC's process provides additional transparency and substantial public input opportunities, which are especially important considering the presence of a community with environmental justice concerns in the project vicinity, and we encourage DOE to continue to take into consideration the public input received through that process.

The HECA project is intended to demonstrate integrated gasification combined cycle (IGCC) and carbon capture technology on a commercial scale, turning a fuel blend -- consisting of 75% coal and 25% petroleum coke (petcoke) -- into a synthesis gas (syngas) in a new power plant capable of generating 405 MW gross power and a nominal 300-megawatts of electricity to the grid. According to the PSA/DEIS, up to 90 percent of the carbon in the raw syngas would be captured, compressed and

transported by pipeline off-site to the nearby Elk Hills Oil Field for injection into deep underground oil reservoirs for enhanced oil recovery (EOR) and carbon sequestration. The project incorporates a proposed manufacturing complex that would produce fertilizer (urea in both liquid and pellet form), and other byproducts for agricultural and manufacturing uses.

Based on our review, we have rated the PSA/DEIS's proposed action as Environmental Concerns – Insufficient Information (EC-2) (see enclosed "Summary of Rating Definitions"). We have concerns regarding potentially significant impacts to groundwater resources, and recommend evaluation of a dry-cooled alternative that could, potentially, reduce water consumption by 17-30%. We also recommend that additional information be included regarding potential onsite and offsite risks to human health and the environment that could result in the event of an accidental release of hazardous materials from the facility. We encourage coordination with the lead response agencies, including the Kern County Fire Department, to ensure that adequate emergency prevention and preparedness measures will be in place. Finally, we recommend a condition of certification requiring additional site characterization prior to construction to further define the level of contamination at the proposed site and to allow time for any needed remediation. Various additional recommendations for disclosure, impact assessment, and mitigation are also included in our attached detailed comments.

EPA appreciates the opportunity to review this PSA/DEIS. When the Final Staff Assessment/Final EIS is released for public review, please send one copy to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 972-3521, or contact Karen Vitulano, the lead reviewer for this project, at 415-947-4178 or vitulano.karen@epa.gov.

Sincerely,

/s/ Connell Dunning for

Kathleen Martyn Goforth, Manager
Environmental Review Office

Enclosure: Summary of EPA Rating Definitions
EPA's Detailed Comments

cc: Homero Ramirez, San Joaquin Valley Air Pollution Control District
Elizabeth Scheehle, California Air Resources Board
Jason Marshall, Department of Conservation, Division of Oil, Gas and Geothermal Resources
Lorelei H. Oviatt, Kern County Planning and Community Development Department
Craig Perkins, Bakersfield Fire Department / Calif. LEPC Region V Chair
Thomas E. Campbell, California Office of Emergency Services, HazMat Fire & Rescue Div.

Alternatives Analysis / Water Use

The PSA/DEIS has a limited alternatives analysis. In our scoping comments (May 2010), EPA suggested that the EIS evaluate the use of dry cooling or wet-dry hybrid cooling as a NEPA alternative to the proposed project. The PSA/DEIS states that a dry cooling or wet-dry hybrid cooling alternative remains under consideration and will be evaluated by CEC in the Final Staff Assessment/Final EIS (p. 6-2); also, that DOE believes that a dry cooling alternative is a project-level alternative that merits further analysis and consideration (p. 6-46). We appreciate this, but note that, for the Final EIS process, no formal public review period will be provided. Since the CEC process allows public comment up until the evidentiary hearings for the project, which will occur after the Final Staff Assessment/Final EIS is issued, we recommend that DOE consider any public comment that is received by CEC regarding a dry cooling alternative. We understand that DOE will wait until CEC makes its decision before signing the NEPA Record of Decision (ROD).

Based on the information in the PSA/DEIS, CEC staff concluded that pumping from the project's proposed industrial supply well field could create significant impacts, including the exacerbation of overdraft in the Kern County subbasin, potentially inducing degraded water to move into the local water-supply aquifer, and an increase in the threat to the California Aqueduct from subsidence. DOE also concluded, in its chapter titled DOE Environmental Consequences, that the project could result in significant impacts to water resources (p. 7 of 7). The PSA/DEIS states that the proposed project could be the most water intensive power plant in California (p. 4.15-38). Because of these potential impacts, every effort to reduce water use by the project should be pursued. We understand that the PSA/DEIS analysis of water supply will be expanded in the final documents.

According to the PSA/DEIS, dry cooling has the potential to reduce project water demand to roughly 17-percent of the currently proposed amount and, thereby, reduce water costs by approximately \$70,000,000 over a 25-year period (p. 4.15-5). The applicant has stated that dry cooling is infeasible (p. 4.15-38); however, we note that the Texas Clean Energy Project, which appears to be very similar to this project, cut its projected water consumption by 30 percent by substituting air-cooling in place of more conventional water-cooling for the project's power block (See <http://www.texascleanenergyproject.com/>). Another potential option to reduce water use could be to utilize a propane-butane-pentane hydrocarbon refrigeration cooling system powered by solar panels to replace/reduce water cooling. We note that eliminating one or more cooling towers would also reduce particular matter (PM) air emissions.

CEC staff also concluded that alternative water supplies were not sufficiently evaluated or were eliminated because they could not supply the proposed project's entire water supply needs (p. 4.15-49). Additionally, CEC staff suggest that pumping water from BGRP Target Area A (as opposed to Target Area B proposed for the project) would better address shallow groundwater concerns and utilize water with no other beneficial uses (p. 4.15-48). We look forward to the conclusions regarding alternative water sources in the FSA/FEIS and support the CEC's efforts to ensure that the project uses the least amount of the poorest quality water available, consistent with the California Constitution and State water policy.

Recommendation: EPA continues to recommend that a dry cooling alternative be evaluated, and commends the CEC for stating that it will pursue this analysis for the FSA/FEIS. The FSA/FEIS should discuss the feasibility of this technology for the proposed project in comparison to the Texas Clean Energy Project. If this technology is, indeed, feasible, we recommend that CEC require this technology as a condition of certification and that DOE require this mitigation measure as a condition of financial assistance. We also recommend that the feasibility of a solar powered propane-butane-pentane hydrocarbon refrigeration cooling system be explored and discussed in the FSA/FEIS.

Hazardous Materials Management

Facility Safety

The section's introductory statement on Page 4.5-2 indicates that CEC staff recognize the importance of process safety analysis as an integral part of project review. The statement also indicates that this project is relatively unique in its complexity, compared to prior projects that the CEC has encountered, and, therefore, requires that significant emphasis be placed on risk analysis. We are encouraged by the acknowledgement of this important aspect of project evaluation. We are also encouraged that the project staff recognize the value of investigating similarly constructed facilities (such as that in Polk County, Florida) to better understand the challenges and risks represented by Hazardous Materials Management at coal gasification and fertilizer production facilities. We note, however, that the introductory statement also includes an error or mis-statement where it apparently concludes that "materials present are below the federal or state thresholds".

As you may be aware, and pertinent to this facility's evaluation and operation, President Obama signed Executive Order 13650 - Improving Chemical Facility Safety and Security on August 1, 2013 to improve the safety and security of chemical facilities and reduce the risks of hazardous chemicals to workers and communities. The order directs the federal government to:

- Improve operational coordination with state and local partners (including State Emergency Response Commissions and Local Emergency Planning Committees);
- Enhance Federal agency coordination and information sharing;
- Modernize policies, regulations and standards, and;
- Work with stakeholders to identify best practices.

Proposals for facilities that manage large quantities of hazardous substances should include a robust examination of inherently safer design opportunities. Such analysis includes the evaluation of chemical substitution or modification in the interest of lowering toxicity or flammability values. Storage configurations/options could also be examined, such as inventory reduction or smaller storage divisions so that a single point of failure (such as a tank failure) has less impact potential than that of a large storage vessel failure.

Recommendations: In the FSA/FEIS, the opening remarks of the Hazardous Materials Management section should reflect the likelihood that the facility will be governed by multiple state and federal hazardous materials standards, and the statement regarding amounts of materials in relation to state and federal thresholds should be corrected.

The FSA/FEIS should demonstrate that the project would be consistent with the requirements of

Executive Order 13650. The fact sheet about Executive Order 13650 can be found at: <http://www.whitehouse.gov/the-press-office/2013/08/01/fact-sheet-executive-order-improving-chemical-facility-safety-and-security>. The full Executive Order 13650 can be found at: <http://www.whitehouse.gov/the-press-office/2013/08/01/executive-order-improving-chemical-facility-safety-and-security>.

Given the large quantities of hazardous substances to be managed, we recommend a robust examination of inherently safer design opportunities and storage configurations/options be included in the FSA/FEIS. Should this analysis reveal that safer design and storage configurations are feasible, we recommend CEC include them as a condition of certification and DOE require them as a condition of funding.

Clean Air Act (CAA) Section 112(r) – Risk Management Plan

The matrix of hazardous materials regulatory requirements (Table 1, p. 4.5-6) mentions the federal Clean Air Act Amendments Section 112 (r) and the federal Risk Management Plan (RMP), but does not identify the requirement that the facility must submit an RMP to the U.S. EPA every five years. The federal RMP program has not been delegated to the state of California. The full range of federal requirements, as delineated in our recommendation below, should be identified in Box 3 on page 4.5-6.

Section 112(r)(1) of the Clean Air Act requires that owners and operators of facilities producing, processing and storing extremely hazardous substances identify hazards associated with an accidental release; design and maintain a safe facility; and minimize consequences of accidental releases that occur. Under Section 112(r) (7) of the CAA, (for which EPA published regulations in 40 CFR Part 68 – Accidental Release Prevention Requirements: Risk Management Programs), stationary sources holding more than a threshold quantity of a listed substance within a process must perform a hazard assessment, implement accident prevention and emergency response programs, and submit a risk management plan (RMP) to EPA.

The specific steps required for the prevention program depend on the level of risk and complexity of a process. The rule establishes three program levels based on processes' relative potential for public impacts and the level of effort needed to prevent accidents. Program 1 covers a limited number of processes that pose comparatively low risks to the public, and imposes minimal accident prevention requirements. The facilities must effectively show there is no potential for impact to off-site receptors, including population and sensitive environments, either by modeling the worst-case release or based on accident history. Program 2 is a default program level that covers any processes not eligible for Program 1 or subject to Program 3, and imposes a streamlined set of accident prevention requirements. Program 3 processes are in certain industrial sectors with substantial accident histories or that are subject to the OSHA process safety management (PSM) standard. Anhydrous ammonia is a toxic chemical that is the most common chemical found in Program 3 processes regulated under Section 112(r) of the CAA.

The PSA/DEIS uses a benchmark ammonia exposure level that is the same as the Risk Management Plan (RMP) level 1 criterion used by EPA and California in its analysis of impacts associated with a release of anhydrous ammonia (p. 4.5-29). It is not clear whether CEC is suggesting that the HECA facility would fall under Program 1 of the Section 112(r) rule. EPA believes that the HECA facility will likely be RMP Program Level 3. Based on the quantity of ammonia stored at the facility, it would likely be subject to the OSHA PSM standard. In addition, its proximity to nearby public receptors (the town of Tupman, including the Elk Hills Elementary School, and the nearby Tule Elk Nature Preserve) would

likely make it ineligible for RMP Program 1. It is important that the impact assessment accurately portray the likely facility RMP Program level based upon the facility profile elements put forth in the document. Similar evaluation and discussion should be provided for any other RMP regulated substances identified in the document.

Recommendation: Table 1 (p. 4.5-6) which lists regulatory requirements, should identify the full range of Risk Management Program requirements in the matrix. Provide additional discussion in the FSA/FEIS regarding the specific elements that would classify the facility as Program 3. The matrix should provide the following corrections/additional information:

- The second and third entries (CAA Amendments of 1990 and CAA risk management plans) both describe EPCRA (Emergency Planning and Community Right-to-Know Act) requirements, not CAA requirements.
- The first entry (SARA) equates it to EPCRA but does not describe its requirements.
- The relevant parts of the CAA that apply are Section 112(r) (1) – the CAA General Duty Clause and Section 112(r) (7) and its implementing regulations – the EPA Risk Management Program. The description should discuss each of those requirements. Also, the Risk Management Program requirements go well beyond submission of a Risk Management Plan (RMP). They also include hazard assessment, accident prevention, and emergency response program requirements, none of which are mentioned in the table.
- The table does not include any entry for CERCLA Section 103 (emergency release reporting requirements).
- The Cal ARP entry mentions the Risk Management Plan requirement, but does not mention the accident prevention program and emergency response program measures required to be implemented under that regulation (which parallel the Federal RMP regulation requirements).
- Correct the apparent typographical error in Table 2 at page 4.5-11 in which the maximum quantity of anhydrous ammonia is described as 3,8000,000 gallons.

Disclosure of Risk

The PSA/DEIS appears to present inconsistent information regarding the risk presented from hazardous materials releases. It is, therefore, difficult to discern whether or not the level of risk posed from accidental release of anhydrous ammonia and other materials has been fully or adequately disclosed. For example, while the PSA/DEIS identifies a number of significant historical ammonia release incidents, the discussion of facility specific modeling scenarios does not appear to take those actual release examples into account. The PSA/DEIS states that modeled results of the most likely release scenario of anhydrous ammonia from a piping leak show that ammonia concentrations exceeding 75 parts per million (ppm) extend a little beyond the facility fence line but do not reach any residential receptor (p. 4.5-30). The document also notes that when using EPA's air dispersion model RMP*Comp, which assesses a complete rupture of one tank, ammonia concentrations exceeding 75 ppm could extend as far as the town of Tupman, 1.5 miles southeast of the project site. However, the PSA/DEIS dismisses this modeling as overly conservative and providing little useful information for assessing impacts under CEQA (and presumably NEPA), opting for the applicant's model to represent the risk the project poses (p. 4.5-30). The anhydrous ammonia discussion concludes with a statement that "the storage and use of

anhydrous ammonia will not result in a significant risk to the off-site public.” As discussed above, this statement appears to be in conflict not only with modeling analyses but also with the actual historical release analysis provided on pages 4.5-14 through 4.5-20. In particular, staff cites the Terra International facility as being most similar to the proposed HECA Urea Ammonium Nitrate (UAN) production facility (p. 4.5-17). Here the document describes a significant ammonia release incident of December 13, 1994 that resulted in “plumes and clouds of ammonia as far away as 5 miles from the facility”. Table 2 also describes the presence of anhydrous ammonia as high vapor pressure; high volume; and high danger. Given this information, the other examples cited and in existence, and broader modeling consideration, the possibility of off-site impact should not be categorically discounted. This is true for ammonia and other of the hazardous materials and RMP regulated chemicals discussed in the PSA/DEIS.

While NEPA does not require the use of specific impact assessment methodologies, we note that this facility will be subject to the Risk Management Program. Thus, it would be appropriate to use RMP methodologies in the impact assessment. As presented in the document, the anhydrous ammonia alternative release scenario revealed in the modeling is intended to show examples of potential impacts for a typical failure mode, of which there can be many examples. However, RMP regulations also require subject facilities to model a worst-case release and potential offsite consequences based on the release of the largest single container (in the case of HECA ammonia storage - 1,900,000 gallons). Ultimately, HECA will need to use the RMP* Comp or a similar type of modeling for compliance with the Risk Management Program requirements. For discussion and comparison purposes, EPA used the available information provided in the document to do preliminary RMP* Comp modeling for HECA based on the release of a single tank over a 10 minute period. With the simple inputs provided, as well as an administrative control value of 85% total volume (1,615,000 gallons out of a 1,900,000 gallons maximum capacity), the model estimated toxic endpoint distance between 13 and 25 miles. As the PSA/DEIS acknowledges, different model inputs and different modeling tools could produce different results. That said, the results produced here suggest that off-site impacts should be fully evaluated and communicated while acknowledging that the data will not address the likelihood that the releases or the impacts will occur. In many cases, particularly for the mandated worst-case release scenario, the likelihood may be very low.

The discussion of the risk that the facility poses should strive to convey meaningful information to the public. With that in mind, we note that the document indicates that figures showing how far the predicted ammonia concentrations would extend from the anhydrous ammonia tank under different accident release scenarios were provided as confidential information to staff. It is not clear why these figures cannot be disclosed to the public. As they are important components of the facility impact analysis, some means of illustration should be provided.

Appendix A of the Hazardous Materials Management chapter provides some useful information that the lead agencies should consider integrating into this impact assessment discussion. For example, it would be helpful for the public to understand the potential symptoms that could be experienced at different release concentrations of ammonia. Additionally, the footnote in Appendix A Table 1 states that the World Health Organization (WHO) warned that the young, elderly, asthmatics, those with bronchitis, and those who exercise should also be considered at increased risk based on their demonstrated greater susceptibility to other respiratory irritants. It does not appear that this increased risk was disclosed sufficiently in this section.

Recommendations: Consider disclosing in the FSA/FEIS information showing how far various predicted ammonia concentrations would extend from the anhydrous ammonia tank under different accident release scenarios. We recommend providing additional discussion regarding the level of risk that the facility imposes. Consider providing information that addresses these questions: what can go wrong; what and how severe are the consequences if it does; and how likely or unlikely a certain scenario is. Also consider disclosing the common symptoms that anhydrous ammonia could cause and health impacts that could result as a way to communicate potential consequences and their severity. Provide this information to medical practitioners in the local area, including school nurses, as a mitigation measure. Similar evaluation and discussion should be provided for all RMP regulated substances or hazardous materials with off-site impact identified in the document.

We recommend that the FSA/FEIS model different exposure levels for sensitive populations in the nearby town of Tupman, which include children at the elementary school who could be more susceptible to the effects of anhydrous ammonia from a worst-case release. Anhydrous ammonia can be immediately dangerous to life or health at 500 ppm. As liquid anhydrous ammonia is released from its container into the air, it expands rapidly, forming a large cloud that acts like a heavier-than-air gas for a period of time. Because the vapors hug the ground initially, the chances for humans to be exposed are greater than with other gases.

To provide context, consider discussing risk levels from common facilities, such as gasoline stations, etc., and summarizing the information from the PSA/DEIS gained from examining the accident history of other facilities and drawing conclusions that can be applied to this facility. We recommend discussing the additional risk in relation to the young, elderly, asthmatics, those with bronchitis, and those who exercise, as noted in Table 1, Appendix A of the Hazardous Materials Management section of the PSA/DEIS. This discussion should occur in relation to the acknowledged environmental justice population in the area. As a mitigation measure, we recommend that procedures be developed for informing the public of an accidental release, with consideration given as to the best communication methods to reach residents, local businesses, schools, childcare facilities, and the public who may be visiting the Tule Elk Nature Preserve, since these groups may require different communication methods.

Finally, as a reference, we are providing a weblink to the recent, federal multi-agency chemical advisory “Safe Storage, Handling, and Management of Ammonium Nitrate.” The link is: www.epa.gov/emergencies/docs/chem/AN_advisory.pdf. It is focused primarily on safe handling and storage of higher density, solid ammonium nitrate pellets and prills used in fertilizers. This advisory is intended to broadly disseminate lessons learned from recent incidents involving ammonium nitrate so that such incidents can be prevented in the future. We recommend that the project proponents review the advisory for any applicable information that could be used to reduce risk at the HECA facility.

Risk associated with off-gassing H₂S

The PSA/DEIS indicates that liquid sulfur has the potential to off-gas significant quantities of hydrogen sulfide (H₂S) and can also be a fire and explosion hazard at high temperatures (p. 4.5-28). While Condition of Certification HAZ-10 would require on-site testing to ensure H₂S levels are low before rail tank cars or tanker trucks leave the site, it is not clear whether the fire and explosion hazard from H₂S off-gassing was considered in the assessment of fire/explosion risk.

Recommendation: Ensure the FSA/FEIS discloses any hazards associated with off-gassing H₂S.

Meteorological conditions

The PSA/DEIS states that wind direction and speeds are discussed in the Air Quality section (p. 4.5-8) but does not discuss this information in relation to how it would affect potential hazardous materials releases and risk. The Air Quality section states that wind speeds are generally higher in the summer than winter and are typically north-northwesterly (p. 4.1-11). Therefore, winds typically blow to the south-southeast. The town of Tupman is located 1.5 miles southeast of the project site.

Recommendation: In the Hazardous Materials Management chapter of the FEIS, discuss the prevailing winds and how they could affect risk to receptors in the town of Tupman, including the Elk Hills Elementary School, which is 1.3 miles southeast of the site.

Emergency Response

The PSA/DEIS states that the different processes and large volumes of hazardous materials that would be utilized at the proposed facility have the potential to pose a serious threat of fire and/or explosion (p. 4.16-1). The Kern County Fire Department (KCFD) Fire Station 25 is 7 miles from the project site in Buttonwillow and would be the first responder to an emergency at the HECA facility (p. 4.16-6). According to the PSA/DEIS, the KCFD has not encountered such a complex power generation facility in its history (p. 4.16-2). CEC staff concludes that, because of the complexity of the proposed HECA facility, the use and storage of vast amounts of flammable and combustible materials, the relatively remote location, and the size of the industrial environment, the KCFD would need to undertake specific efforts related to the facility (p. 4.16-23). These include complex plan reviews, frequent hazmat and fire inspections, and emergency response including medical, fire, rescue and hazardous materials incidents. Additional fire and hazmat response training may be required for KCFD personnel as well as additional emergency response vehicles and personal protective equipment.

The KCFD requested nine specific mitigation measures to address their equipment and personnel needs. CEC staff reviewed costs of equipment and fire fighters' salaries (plus benefits) in other jurisdictions and arrived at an estimate of funds needed to provide necessary mitigation. The County of Kern's comments dated July 23, 2013 stated that the Fire Department found the amounts identified in the PSA/DEIS insufficient to implement the specific mitigation measures requested by the KCFD in order to adequately mitigate the impacts of HECA.

Recommendation: The CEC should continue to work with the KCFD to ensure that the first responders for an emergency response incident are fully staffed and prepared to address the potential hazards presented by the project.

Transportation of Hazardous Materials

The PSA/DEIS includes a condition of compliance requiring trucks transporting hazardous materials to take the shortest distance of travel to the site, consisting of Interstate 5 via Stockdale Highway, to Morris Road, to Station Road, to the plant site. Figure 5 shows dwellings along Station Road. The PSA/DEIS does not discuss sensitive receptors that occur along this route and what, if anything, could be done to improve safety of trucks containing hazardous materials.

Recommendation: Discuss potential risks to receptors along the route that would be used for transport of hazardous materials. Evaluate the safety of the route in terms of the necessary turning radius, signage, etc. Identify any measures that could reduce the potential for accidents or that could mitigate the risks to local receptors in the event an accident occurs. Coordinate these planning activities with the local authorities, including the Local Emergency Planning Committee. Identify any concerns regarding the safety of passing motorists.

Public Notification of Accidental Release/Air Quality or Detection Monitors

The public has raised concerns regarding notification of accidental releases and expressed a preference for early warning monitors or detectors that could indicate a release. The Rio-Bravo Union School District has commented that it would alleviate concern knowing such a monitor was in place.

Recommendation: Consider requiring monitors on the grounds of the closest schools, including Elk Hills Elementary and, perhaps, other key locations based on prevailing winds. Depending on the monitor, data could be downloaded to publically accessible websites, which could help to build trust between the project proponent and the community.

Minor comment

The PSA/DEIS incorrectly indicates that the U.S. Chemical Safety Board issued recommendations following an incident that occurred at the Chevron Refinery in Richmond, CA on August 6, 2012 (p. 4.5-27, 4.5-33). The correct date of that incident was August 2, 2012.

Waste Management

Resource Conservation and Recovery Act (RCRA) Mining Waste Exclusions

Waste Management Table 1 - Laws, Ordinances, Regulations, and Standards lists “40 CFR §261.4(b)(7)(ii)(F): Exclusions: Solid Wastes which are Not Hazardous Wastes - Coal gasification” and states that this law excludes gasifier ash from coal gasification and process wastewater from coal gasification from being considered as a hazardous waste (p. 4.14-4). In the Mining Waste Exclusion Final Rule (54 Fed. Reg. at 36596), EPA determined that residuals from treatment of excluded mineral processing wastes must be historically or presently generated, and must meet the high volume/low hazard criteria in order to retain excluded status under the Bevill Amendment. Bevill exemptions are a one-time event, and do not extend to new, different waste streams arising in the future. New wastes generated in the future are regulated under either Subtitle C or Subtitle D regulatory programs. (See RCRA Online, #14809¹). The PSA/DEIS states that the project owner does expect the gasification solids to be nonhazardous based on available information from existing Integrated Gasification Combined Cycle (IGCC) facilities (4.14-18). The applicant has proposed to provide information on the gasification solids characteristics after research has been conducted on similar facilities located in Japan. In the PSA, CEC staff requests that this information be provided prior to issuance of the FSA/FEIS. We agree with CEC staff that the final disposition of the gasification waste as either a Class I (hazardous) or Class III (nonhazardous) waste should be determined prior to project construction so a strategy for management of the waste can be developed.

¹ See:

<http://yosemite.epa.gov/osw/rcra.nsf/0c994248c239947e85256d090071175f/88a58fddaf8e2be4852576d50062ad79!OpenDocument>

The PSA/DEIS states that, if the gasification solids are determined to be hazardous and all or most of the waste generated would need to be disposed of in Class I landfill facilities, the project could pose a very significant impact to California Class I landfill capacity (p. 4.14-26). The project would generate 246,016 cubic yards of gasification waste annually. Multiplying that amount over the project life of 25 years would represent 61% of existing landfill capacity, well above the 10% significance threshold the impact assessment utilized.

Recommendation: Amend the impact assessment to consider the nonapplicability of the Bevill amendment/nonexclusion of gasifier solids from hazardous waste regulation. Provide results of a waste characterization of gasifier solids to determine whether they would be hazardous or non-hazardous. Include a waste management strategy, as recommended by CEC staff, in the FSA/FEIS, detailing where waste would be disposed. If it appears that the gasifier solids would need to be disposed of as hazardous waste, discuss alternative disposal options should capacity be limited at California Class I landfills.

Onsite contamination

Previous land uses at the HECA project site have resulted in soil contamination. According to the PSA/DEIS, preliminary soil sampling was performed and the results of soil sampling and analytical testing indicate there are elevated concentrations of petroleum hydrocarbons and other contaminants. Concentrations of the pesticides dieldrin, endrin, and endosulfan that were detected exceed the Regional Water Quality Control Board (RWQCB) Environmental Screening Levels. The Department of Toxic Substances Control (DTSC) has indicated that additional site characterization is required to further define the level of contamination at the proposed site (p. 4.14-12). CEC Staff are recommending that the site be appropriately characterized prior to the Final Staff Assessment (p. 4.14-1), stating that the project owner “*should enter into an Agreement with DTSC for the purpose of fully characterizing and if necessary remediating the site property so that it is in the appropriate condition to allow for future use. In addition based on the type of agreement with DTSC the applicant should conduct the necessary site characterization to determine if site remediation is needed and if so what the scope of remediation would be prior to the FSA*” (p. 4.14-31). Despite this recommendation, the conditions of certification require only that a Soils Management Plan be prepared 45 days prior to any earthwork, addressing how contamination will be handled if encountered in the field “*as evidenced by discoloration, odor, detection by handheld instruments, or other signs*” (p. 4.14-32). We concur with the recommendation that a robust Soil Management Plan be developed to address potential contaminated soil that may be encountered during project construction, but believe a clearer picture of the extent and nature of contamination and the possible need for remediation should be established prior to the start of earthwork.

Recommendation: As recommended by CEC staff, fully characterize the level of contamination at the project site and include the information in the FSA/FEIS. If this does not occur, we recommend that a condition of certification be included requiring full characterization, and preliminary remediation plans if needed, prior to construction at a time sufficient to allow for any needed remediation.

Health Risk Assessment

Consideration of existing health impacts in community with Environmental Justice concerns

The PSA/DEIS concludes that the HECA project would not result in any significant risk of cancer or any short-term or long-term health effects to any members of the public, including low income and

minority populations, from project toxic emissions (p. 4.8-52) and states that the analysis uses a conservative health-protective methodology that accounts for impacts to the most sensitive individuals, including a developing fetus, newborns, infants, and the elderly (p. 4.8-52). The PSA/DEIS also identifies the pre-existing health conditions of Kern County and Bakersfield residents, specifically that the mortality rate for asthmatics in Kern County is higher than that for the State of California, and the city of Bakersfield was found to have the highest asthma hospitalization and emergency department visit rates of Kern County, with hospitalization of African American asthmatics 2.3 times higher than the rate of hospitalization of whites, and 3.6 times greater than the hospitalization rate of Hispanics (p. 4.8-7). In addition, mortality rates from coronary heart disease in Kern County are 20% higher than those for the State of California (p. 4.8-6). The PSA/DEIS states that it considered this information when assessing the incremental and cumulative risk and hazard posed by emissions from the proposed project (p. 4.8-7), including people with existing medical conditions (p. 4.8-11).

Based on the description of the methodology, it is not clear how the preexisting health conditions were considered or how this information affected the conclusions, if at all. We understand from CEC staff that the consideration of pre-existing health conditions is a qualitative consideration, but some discussion of the combined effects should be included, especially since impacts would be occurring to an identified environmental justice population (p. 1-2).

Recommendation: We recommend clarifying how the health risk assessment considered the pre-existing health conditions in Kern County and Bakersfield. Discuss environmental justice /Civil Rights Act Title 6 considerations of the population and whether or how these considerations could affect health risk. For example, discuss whether any local populations are medically underserved, which generally refers to individuals who lack access to primary and specialty care either because they are socioeconomically disadvantaged and may live in areas with high poverty rates or because they reside in rural areas. More information about medically underserved communities can be found at <http://www.hrsa.gov/shortage/mua/index.html>.

Impacts from truck emissions along transportation routes

The risk assessment included assessing risk from diesel particulate matter (DPM) from construction equipment at the project site as well as an assessment of risk posed to the off-site public located along the transportation routes during operations. For the latter, emissions from diesel trucks along Station Road were thought by CEC staff to represent the point of greatest emissions of DPM, so the applicant assessed impacts at that location and added them to the emissions resulting from stationary sources on the facility site. It is not clear whether the receptors along Station Road were also included in the assessment of construction-phase risk. Table 2 on p. 4.11-14 indicates that there would be over 3,700 daily peak trips during the construction phase, which is substantially higher than the trips identified for the operational phase (1,064 with rail spur, 2,906 without rail spur) on p. 4.11-21.

Recommendation: Ensure and confirm in the FSA/FEIS that the discussion of risk during the construction phase includes the emissions from truck travel to the receptors along Station Road, which were thought to represent the point of greatest emissions of DPM.

Refined Health Risk Assessments after construction

Proposed Conditions of Certification PUBLIC HEALTH-1 through 3 require preparation of protocols for testing toxic air contaminant (TAC) emissions from certain sources, conducting source tests and preparing a health risk assessment based on them, and, if the results show the risks to public health are

greater than 10 in one million or a Hazard Index is greater than 1.0, submitting plans to address this matter by either submitting a protocol for a more refined health risk assessment or plans for the reduction in the emissions of certain TACs. It is not clear what options are available to the project proponent to reduce TAC emissions, what feasibility restrictions would be allowed, and how such requirements would be enforced if the project has already been approved and constructed.

Additionally, the PSA/DEIS states that, if chromium+6 is found to be present in groundwater to be used for the cooling towers, the risk hazard could be significantly greater than estimated. It is not clear what options are available should chromium+6 be detected in the project's proposed groundwater source.

Recommendation: Expand on the potential outcomes of Conditions of Certification PUBLIC HEALTH-1 through 3. Describe potential options to reduce TACs that are available should risk prove to be greater than the significance threshold. If no options to reduce TACs are available, identify whatever other mitigation measures, if any, would be required.

We recommend discussing the probability that chromium +6 could be present in the proposed industrial water supply and whether feasible measures are available to remove it or otherwise mitigate any increased health risk from its presence. If it is determined that there is a high probability, we recommend sampling the water source so that the information can be used to update the estimated risk/hazard in the FSA/FEIS.

Greenhouse Gases and Carbon Sequestration

The PSA/DEIS evaluates the Enhanced Oil Recovery component of the project, which involves pressurizing CO₂ and piping to the oil fields of Occidental of Elk Hills, where it would be used for EOR and, in the process, would be geologically sequestered. The Department of Conservation, Division of Oil, Gas, and Geothermal Resources is coordinating with OEHI to review OEHI's Class II permit applications for the first phase of its CO₂ EOR proposal. The wells to be used for injection of the CO₂ would be permitted as Class II injection wells under the Underground Injection Control program pursuant to the Federal Safe Drinking Water Act. DOGGR has primacy to approve Class II injection wells in the state of California under Section 1425 of the SDWA. EPA Region 9 retains oversight authority and will review the Class II permit when it is proposed and provide DOGGR with any comments regarding permitting standards and their applicability to the operation, technical challenges, and protectiveness, as defined under the UIC program of the SDWA.

We agree with CEC staff's suggestion that, at this stage of planning, HECA should enter into a binding contract with Occidental of Elk Hills, Inc. that identifies the responsibilities of each party to demonstrate and document permanent sequestration of the supplied CO₂. CEC is also proposing that this contract require OEHI to provide a CO₂ Emissions Sequestration Plan that details the design and operation, monitoring, and recordkeeping requirements for ensuring CO₂ emissions sequestration (condition of certification GHG-3). Equally important is proposed condition of certification GHG-2, which would require the project owner to shutdown gasifier operations if OEHI stops accepting the CO₂ for sequestration or otherwise as necessary for compliance with the CO₂ Emissions Performance Compliance Plan, SB 1368, or other regulatory requirements. EPA fully supports these conditions.

Recommendations: Retain all proposed Conditions of Certification for Greenhouse Gases and carbon sequestration in the FSA/FEIS.

Natural gas emissions

The PSA/DEIS states: “*There would also be the recovery of associated natural gas and natural gas liquids that would be sent offsite for sale by pipeline. In terms of their carbon and energy value they would be recovered in rates that would be much lower than the oil recovered. Therefore, these products are not the focus of the EOR component and their recovery rate has not been estimated by OEHI.*” (p. 4.3-28). We note that methane (CH₄) has a significantly higher global warming potential than CO₂. Pound for pound, the comparative impact of CH₄ on climate change is over 20 times greater than CO₂ over a 100-year period. Because of this, atmospheric releases of even small quantities of natural gas will negate some of the carbon dioxide sequestration benefits of the project and should be addressed.

Recommendation: Specify methods and/or operating conditions to ensure natural gas produced from Elk Hills Oil Fields is captured for use as a fuel and not vented to the atmosphere. Ensure any releases of natural gas/methane to the atmosphere are measured and accounted for in the Emissions Performance Compliance Plan (Condition of Certification GHG-1).

Reducing potential for CO₂ leakage from old wells

According to the PSA/DEIS, hundreds of wells have been installed in the Elk Hills Oil Field for injection and production over the decades of petroleum extraction activity, as well as the thousands of well bores that abound in the site for different purposes and at varying depths of penetration (p. 4.3-6). It indicates that the presence of such a large number of well bores in the seismically active project site creates a potential for leak pathways of injected CO₂ (p. 4.3-59). CEC staff recommends that HECA enter into an agreement with OEHI to require installation of a robust monitoring network capable of detecting leaks.

Recommendation: To the extent practicable, efforts should also be made to locate and permanently seal old wells that could provide a conduit for CO₂ leakage.

Indirect emissions from fertilizer use

The PSA/DEIS identifies some offsite GHG emission sources, including material and product transport and employee transportation (p. 4.3-31), and DOE acknowledges that the oil produced by EOR would ultimately lead to emissions of CO₂ to the atmosphere when the oil-derived products are produced and consumed (p. 4.3-19). Another source of indirect emissions would be the use of fertilizers produced by the project. The project’s urea production unit would use pastillation technology, which converts urea melt into high quality urea pastilles (small solid pellets). A literature review¹ indicates that there are ways to manufacture urea fertilizers to reduce emissions of nitrous oxide (N₂O) when they are used as fertilizers, including adjusting urea granule size. N₂O is a powerful greenhouse gas. The impact of 1 pound of N₂O on warming the atmosphere is over 300 times that of 1 pound of CO₂.

Recommendation: In the FSA/FEIS, disclose indirect GHG impacts from use of fertilizer, similar to how the indirect impacts from use of oil were discussed. Explore and discuss fertilizer manufacturing techniques and the feasibility of producing a fertilizer with reduced potential for N₂O emissions. If this is deemed feasible and would reduce N₂O emissions significantly, we recommend that such manufacturing techniques be pursued.

¹ See <http://pubs.acs.org/doi/abs/10.1021/bk-2011-1072.ch009>

Air Quality

Air Quality Analysis

The calculation of air quality emissions from cooling towers assumes that PM_{2.5} emissions are 60 percent of the total particulate matter (PM₁₀) cooling tower emissions (Table 17, p. 4.1-43). Specifically, PM_{2.5} is estimated at 15.30 tons per year (tpy), while PM₁₀ is estimated at 25.50 tpy. The basis for this assumption is not provided, and the PSA/DEIS raises concerns about its technical validity. It appears likely that the assumption is based on the California Air Resources Board (CARB) database information in its California Emissions Inventory Development and Reporting System (CEIDARS), which is not specific for cooling towers.

A source that emits or has the potential to emit 100 tpy or more of PM_{2.5} in a nonattainment area is defined as a major stationary source. In the PSA/DEIS, total PM_{2.5} project emissions are estimated at 79.91 tpy; the total PM₁₀ project emissions are estimated at 90.11 tpy. Therefore, even if the portion of PM_{2.5} emissions from the cooling towers were assumed to be 100% of the PM₁₀ emissions, the total PM_{2.5} project emissions would be approximately 10% below the 100 tpy federal major source threshold. According to the PSA/DEIS, the applicant has made recent revisions to the project, including adding 59,000 tpy of a limestone fluxant to the gasifier feedstock, which would impact transportation emissions and stationary source emissions as well as Air District permitting requirements (p. 4.1-2, 4.1-25). CEC staff has noted the need for additional information related to the limestone fluxant to update the air quality and greenhouse gas analyses for the FSA/FEIS (p. 4.1-2).

Recommendation: Explain the basis for the size fraction of PM_{2.5} emissions from the cooling towers used in the emissions calculations. In the absence of a defensible rationale otherwise, it should be assumed that PM_{2.5} emissions from the cooling towers are equal to the estimated PM₁₀ emissions.

Amend the air quality and greenhouse gas analyses to include emissions associated with the limestone fluxant, and discuss regulatory/permitting applicability.

Air Quality Mitigation

The PSA/DEIS states that the Project should comply with all applicable air quality laws, ordinances, regulations, and standards and should not result in significant air quality impacts provided the recommended conditions of certification are adopted by the Commission and implemented by the project owner (p. 1-28). The PSA/DEIS proposes robust conditions of certification addressing fugitive dust control and response, which include minimizing coal dust from rail and trucks, diesel-fueled engine control and locomotive engine controls. EPA emphasizes the importance of implementing the proposed conditions of certification AQ-SC-1 through AQ-SC-14 for impacts to be less than significant. We particularly emphasize the importance of using the highest Tier engine available that meets the California Emission Standards for Off-Road Compression-Ignition Engines requirements or installation of an oxidation catalyst and soot filters on diesel equipment.

Recommendation: Include all conditions of certification for air quality in the FSA/FEIS. We encourage DOE to require these mitigation measures as conditions of financial assistance.

Mercury disposal

The PSA/DEIS indicates that mercury would be generated from processes at the facility, including its removal from the syngas using activated carbon (p. 4.5-14) and from the coal dryer exhaust using a baghouse and activated carbon (p. 4.1-20, 4.1-25). No discussion of mercury handling or disposal is included.

Recommendation: Describe in the FSA/FEIS how mercury waste from the project will be managed and disposed.

Worker Safety - Valley Fever

The PSA/DEIS identifies Valley Fever (Coccidioidomycosis) as an existing public health concern (p. 4.8-5) which appears to be on the rise in Kern County (p. 4.8-122). Trenching, excavation, and construction workers are often the most exposed population. Kern County, located at the southern end of the San Joaquin Valley, is where Valley Fever occurs most frequently (p. 4.16-14). CEC staff propose condition of certification WORKER SAFETY-7 which would require that the dust control measures found in proposed Conditions AQ-SC3 and AQ-SC4 be supplemented with additional requirements, including the monitoring of airborne dust (PM10) to ensure that dust control methods are effective. (p. 4.16-20).

Recommendation: We support the CEC staff recommendations identified above; however, because of the high risk for valley fever in Kern County, we recommend consideration of the following additional measures for inclusion in condition of certification WORKER SAFETY-7:

The Environmental Awareness Program for the workers should include training on the health hazards of Valley Fever, how it is contracted, what symptoms to look for, proper work procedures, how to use personal protective equipment, the need to wash prior to eating, smoking or drinking and at the end of the shift, and the need to inform the supervisor of suspected symptoms of work-related Valley Fever. The training should identify those groups of individuals most at risk and urge individuals to seek prompt medical treatment if Valley Fever symptoms (flu-like illness with cough, fever, chest pain, headache, muscle aches, and tiredness) develop.

If possible and to the extent practicable:

- Avoid areas that may harbor the fungus.
- Restrict high risk workers from contaminated areas.
- Test soils to be disturbed for presence of the fungus, understanding that even in known endemic areas, the distribution of the fungus in the soil is sporadic.
- Require that grading and construction equipment cabs be enclosed, High-efficiency particulate air (HEPA) ventilated, and air-conditioned.
- Require use of personal protective equipment in dusty work areas. Provide for disposable clothing, methods to clean work boots at the end of the shift, and a NIOSH certified N95 respirator, at a minimum, or one with a higher protection factor.
- Provide personal hygiene (washing) facilities.
- Require crews to work upwind from excavation sites.
- Pave construction roads.
- Minimize ground disturbance as much as possible. Revegetate temporarily disturbed areas promptly.

- Discourage workers from carrying any fomites home with them. Institute hygiene measures to limit dust transport offsite (see third bullet under “Additional Comments”, below).
- Consider limiting visitor site access without proper training or personal protective equipment.
- Prohibit work activities when wind speeds exceed 25 mph.
- Contact the local or state public health agency for more information regarding the incidence of Coccidioidomycosis in the project area and surrounding region. Provide local public health officials with a schedule of project activities that disturb soil.

Wetlands and Clean Water Act Section 404

The PSA/DEIS states that it is unclear whether the project complies with Section 404 of the Clean Water Act since the Corps of Engineers has not issued a Jurisdictional Determination for the project (p. 4.2-107). The applicant has requested authorization for the temporary fill of 0.20 acre of non-wetland Waters of the U.S. from the Corps under Nationwide Permit 33 (p. 4.2-82) and has proposed to avoid all potentially state and federally jurisdictional waters during the CO₂ pipeline installation by using Horizontal Directional Drilling underneath water features, including the point where the carbon dioxide pipeline would cross under the California Aqueduct, Westside/Outlet Canal, and Kern River Flood Control Channel (p. 4.2-81). The carbon dioxide pipeline route supports several ephemeral drainages with a defined bed and bank (p. 4.2-18).

Ephemeral drainages perform a diversity of hydrologic and biogeochemical functions. Healthy ephemeral waters with characteristic plant communities control rates of sediment deposition and dissipate the energy associated with flood flows, and provide habitat for breeding, shelter, foraging, and movement of wildlife. We support maximum avoidance of ephemeral drainages, regardless of jurisdiction, so that these functions are maintained.

CEC staff proposed mitigation for state jurisdictional waters consists of requiring a Horizontal Directional Drilling Plan and a frac-out contingency plan to avoid escape of drilling mud to the water surface as a result of a spill or tunnel collapse.

Recommendation: We recommend including the Corps’ jurisdictional determination in the FSA/FEIS. We support the avoidance strategy of the applicant and recommend it be documented in a condition of certification. We agree with the proposed condition of certification requiring an HDD plan, including a frac-out plan, and recommend that it be included in the FSA/FEIS.

Cultural Resources

The PSA/DEIS indicates that the cultural resource impact assessment is not complete, but tentatively concludes that the project may have a significant direct impact on historical resources and historic properties, and impacts may be incurred upon known, significant archaeological and historic built environment resources. Additionally, the proposed project could result in significant adverse changes to an unknown number of as-yet unidentified, buried archaeological resources. CEC staff concludes that burials would likely be encountered should the proposed project be built (p. 4.4-1).

We support the proposed conditions of certification, particularly the presence of Native American monitors referenced in CUL-1 because of the probability that burials could be encountered.

Recommendation: Continue consultation with the interested Native American tribes to address their concerns regarding the project. Ensure that Native American monitors from the tribes undergoing tribal consultation are invited to observe excavation activities.

Additional Comments

- The PSA/DEIS acknowledges that the project's use of the existing Wasco coal transloading facility would require expansion and improvements to the facility, possibly including additional storage silos and/or receiving lanes for trains and/or haul trucks, and that these impacts were not evaluated in the PSA/DEIS. Additionally, the applicant recently added limestone and ammonium nitrate storage to the project activities, which would change the number of truck trips to and from the project site. We agree with CEC staff that impacts from both of these components should be part of the scope of the impact assessment. It is EPA's understanding that CEC staff will be analyzing these potential impacts in the FSA/FEIS.
- The DEIS states that the facility will bring in municipal water from the West Kern Water District for potable water. Used water will be recycled and the facility will not generate wastewater. The facility should color code water lines to avoid cross contamination.
- Preventing take-home exposure is important for worker safety. The applicant should implement measures to prevent workers from taking home any contamination from the site and potentially exposing non-workers, particularly children, living in the same household to contaminants. Measures could include providing for laundering of work clothes/uniforms, showers, and lockers for workers to store their clothes and shoes, and implementing a program to educate workers about take-home exposure and ways to prevent it.
- The PSA/DEIS states that loading and unloading activities will occur in enclosed buildings and both waste and the raw materials for the fuel mix (coal and petcoke) will be stored in enclosed areas. It is not explicitly stated that the ground surface will be lined to prevent soil contamination. This should be clarified in the FSA/FEIS.
- The PSA/DEIS states that, if a new rail line is built, periodic inspections of the area near the new rail line that transports materials in and out of the facility could help the operator assess whether there is any coal spillage from the railcars. The facility should be required to conduct these inspections and develop procedures for prevention and cleanup of spillage, if spillage is detected.