ADDENDUM TO THE UC DAVIS RENEWABLE ENERGY ANAEROBIC DIGESTER PROJECT TIERED INITIAL STUDY AND NEGATIVE DECLARATION

(State Clearinghouse No. 2012072005)
March 2019

I. Introduction

This March 2019 Addendum to the Renewable Energy Anaerobic Digester ("READ Biodigester") Project Negative Declaration (ND) discusses the modifications to the existing READ Biodigester at the UC Davis campus site, relative to the requirements of the California Environmental Quality Act (CEQA).

In 2013, the University of California Davis adopted the Renewable Energy Anaerobic Digester ("READ Biodigester") Project Negative Declaration (ND). The project analyzed in the ND was the construction and operation of a 50-ton per day anaerobic digester that would use campus organic waste to produce electricity at the former campus landfill site west of Country Road 98 on the west campus. The waste-to-renewable energy facility was subsequently constructed to accept agricultural waste, animal manure and bedding, food waste from the campus dining commons, and the organic component of municipal solid waste (MSW) generated on the campus, process the waste in a biodigester, and use the biogas produced in the biodigester and the campus landfill gas to generate electricity in a low emissions internal combustion engine (ICE). The facility involves five primary processes: (1) material receiving and preparation; (2) anaerobic digestion; (3) refinement of biogas; (4) generation of electricity using biogas and landfill gas; and (5) effluent treatment to process and dispose of any solid or liquid byproducts of the process.

Pursuant to CEQA and implementing guidelines, UC Davis has prepared this Addendum to the previously adopted READ Biodigester ND to address the proposed changes to the UC Davis READ Biodigester operations (the "Project"). The purposed and scope of this document is as follows: (1) to describe the operational changes; (2) to evaluate the potential environmental effects of the changes; and (3) determine whether there are any new significant impacts not previously addressed in the ND or whether significant impacts previously identified in the ND would substantially increase.

II. Project Modification Description

Two project modifications are proposed. The first modification is a change in how the biogas is used for energy generation. Historically, the gas was combusted in a microturbine on the READ site to generate electricity. UC Davis has abandoned the microturbines due to high maintenance costs. The proposed change in the project is to route the gas mixture through an underground pipeline approximately one mile north to the California National Primate Research Center (CNPRC) Facility where it will be combusted in a boiler to generate heat. The second modification is that the facility will no longer use zeolite to remove ammonia from the digestate and is proposing to use a distillation process to recover ammonia.

Modification #1: Routing of Gas to Offsite Boiler

The purified biogas/landfill gas mixture would be routed to the CNPRC through an existing underground pipeline. The CNPRC contains a central district energy plant that produces steam for building heating and sterilization and cleaning. The central plant contains two boilers, one of which is configured to burn a mixture of natural gas and biogas/landfill gas. The pipeline was used previously to route landfill gas to the CNPRC prior to the existence of the READ facility and its microturbines. In scenarios when the CNPRC boilers are unable to consume the gas produced at the READ facility, it will be flared in the existing flare on the READ site.

Modification #2: Effluent and Solids Treatment

In addition to biogas, the digestion process produces a liquid waste slurry called digestate. The slurry is primarily water, but also contains undigested organic material, as well as dissolved gases, like carbon dioxide and ammonia. The digestate is filtered to remove solids. The solids are hauled offsite for composting.

Historically, the filtered liquid digestate stream has also been hauled offsite by a third party at a considerable expense. It is preferable to treat the digestate at the UC Davis Wastewater Treatment Plant (WWTP), although the digestate contains too much ammonia and would result in the WWTP effluent exceeding its permissible ammonia levels. Therefore, UC Davis engineers have worked with a third party to develop a process to remove ammonia from the digestate, making it suitable for treatment at the WWTP.

In the proposed deammonification system, digestate is contacted with an air-steam mixture in a distillation column. The high temperatures help to strip the ammonia from the digestate, such that only 10% of the initial ammonia remains in the treated digestate. This ammonia level is sufficiently low that the digestate can be treated in the WWTP. The proposed deammonification system would be installed within the existing READ Biodigester footprint.

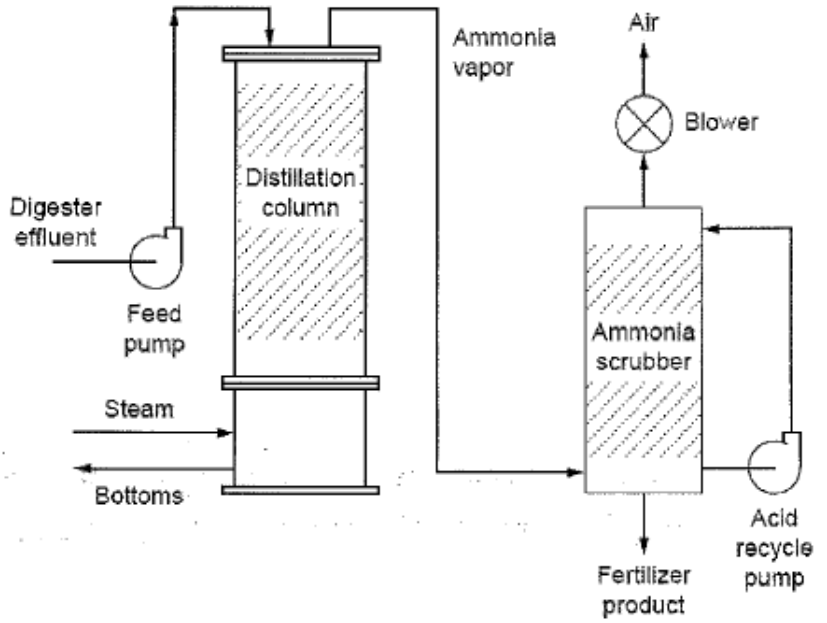
The proposed digestate ammonia removal process (Figure 1) consists of two landfill/biogas operated steam boilers, distillation column, two condensers, ammonia scrubber, circulation pump, acid dosing pump, acid storage, blower, and other ancillary equipment. The distillation column would produce a vapor that contains mostly carbon dioxide and water, with up to 5% ammonia (by volume). This vapor stream would not be suitable for release to the atmosphere without treatment, so it would be routed to a scrubbing column where ammonia would be removed by a dilute sulfuric acid solution. The proposed acid scrubber, Envitech's Packed Bed Ammonia Scrubber, guarantees an ammonia removal efficiency of greater than 97.5%. The sulfuric acid solution would absorb the ammonia to form aqueous ammonium sulfate. The liquid ammonium sulfate would be a stable solution that could be used as fertilizer by local farmers. The treated vapor would be vented to the atmosphere and would contain traces of ammonia.

For heating the digestate, UC Davis has a list of three proposed small boilers certified by the South Coast Air Quality Management District (SCAQMD) as compliant with the requirements of Rule 1146.2. The specifications for all three boilers are attached to this application. The proposed boilers will be approximately 1.6 MMBTU/hr. each (3.2 MMBTU/hr. total) maximum heat input rating.

No changes to general project operations are proposed such as number of employees, deliveries parking or access locations. No expansion of the existing READ Biodigester footprint is proposed.

Figure 1 - Modification #2: Effluent and Solids Treatment

Flow Diagram



Reactions

The reaction of interest in the Ammonia Distillation Column is:

1. $NH_4^+ + OH^- \leftrightarrow NH_3 + H_2O$

The reactions of interest in the Ammonia Scrubber are:

1. $NH_3 + H_2O \leftrightarrow NH_4^+ + OH^-$
2. $H_2SO_4 \leftrightarrow H^+ + HSO_4^-$
3. $HSO_4^- \leftrightarrow H^+ + SO_4^{-2}$
4. $2NH_4^+ + SO_4^{-2} \leftrightarrow (NH_4)_2SO_4$

III. Criteria for an Addendum

"An addendum to an adopted negative declaration may be prepared if only minor technical changes or additions are necessary and none of the conditions in [CEQA Guidelines] Section 15162 calling for the preparation of a subsequent EIR or negative declaration have occurred." (CEQA Guidelines Section 15164.) CEQA Guidelines section 15162, state that no additional environmental review shall be prepared for a project unless the public agency with the next discretionary approval determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

(1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or Negative Declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

The legal standards set forth in CEQA Guidelines Section 15164 for preparation of an addendum to the UC Davis READ Biodigester Negative Declaration are met here. That is because none of the conditions or circumstances that would require preparation of a subsequent or supplemental negative declaration or environmental impact report (EIR) pursuant to Public Resources Code Section 21166 and CEQA Guidelines Section 15162 exist in connection with the proposed changes to the project. The proposed Project addressed in this Addendum does not trigger any of the conditions necessitating preparation of a subsequent environmental review; therefore, as documented in this addendum, only minor additions to the Final IS/Negative Declaration are necessary to evaluate the Project.

Since adoption of the UC Davis READ Biodigester Negative Declaration in May 2013, the University of California completed the 2018 Long Range Development Plan (LRDP), a campus-wide land use and physical development plan. Since adoption of the ND, the University certified the 2018 LRDP EIR and approved the 2018 LRDP, which is considered a change in the circumstances under which the project will be implemented. The READ Biodigester Project is consistent with the land uses, land use

density, and location of this type of land use in the 2018 LRDP. The campus is now implementing the 2018 LRDP MMRP that was adopted by the University in connection with its approval of the 2018 LRDP and certification of the 2018 LRDP EIR. 2018 LRDP EIR mitigation measures apply to new construction on the campus; therefore, would apply to the READ Biodigester project.

Despite the subsequent adoption of the 2018 LRDP EIR, as discussed above, any changes with respect to the circumstances under which the proposed revised project would be undertaken are not substantial changes that would require major revisions to the Negative Declaration for the UC Davis READ Biodigester project. In addition, there is no new information of substantial importance, which was not known and could not have been known at the time that the UC Davis READ Biodigester Negative Declaration was adopted showing that new or more severe environmental impacts not addressed in the UC Davis READ Biodigester Tiered Initial Study and Negative Declaration would occur, that mitigation measures or alternatives found infeasible in the 2013 project approval would in fact be feasible and would substantially reduce one or more significant impacts. The subsequent certification of the 2018 LRDP EIR and approval of the 2018 LRDP have updated the analysis of significant effects on the environment due to campus growth and development, and resulted in implementation of new mitigation measures to reflect current conditions for new UC Davis development and for cumulative growth. These mitigation measures will be implemented for all development under the 2018 LRDP, including the proposed project, and are being monitored pursuant to the LRDP Mitigation Monitoring Program adopted in connection with approval of the 2018 LRDP. As currently written, and in light of the conditions known as of this date, this Addendum is consistent with the criteria for preparation of a CEQA addendum.

IV. Analysis of Potential Environmental Impacts

The revised project would not alter any of the conclusions of the 2014 LRDP EIR analyses under any analysis topic area. Below are the environmental topic areas that warrant discussion:

A. Aesthetics

No revisions have been proposed to the Project as analyzed in the Negative Declaration that would change the appearance of the project. The project site and access to stay the same. Because the Project appearance remains unchanged from the previously evaluated Project and there are no changed Project conditions or new information, the conclusions of the Mitigated Negative Declaration remain valid and therefore no additional analysis or mitigation measures are required for aesthetics. Additionally, in preparing this addendum, the University did not identify any new mitigation measures or project revisions that have become available since the adoption of the Mitigated Negative Declaration and that would further lessen the previously identified impacts.

B. Agricultural and Forestry Resources

The Negative Declaration identified that the project would have no impacts to agricultural resources because the project is taking place within an urbanized area. Since adoption of the Negative Declaration, no agricultural resources have been initiated on the project site and the revised project would have no impact on agricultural resources. The project site is located on

the recently closed UC Davis landfill. The project site itself is considered Urban and Built-Up Land. There are no agricultural resources on the project site. The land directly north of the project site is designated Prime Farmland, as is the land to the east of the former landfill on the east side of County Road 98.

C. Air Quality

The READ Negative Declaration analyzed air quality impacts associated with construction and operation of the biodigester facility. The READ Negative Declaration determined that the Project would result in less-than-significant impacts to air quality. The minor revision to the project would not change the severity of these impacts. The biodigester was constructed and already operated, although currently off-line due to maintenance. The revised Project would route purified biogas/landfill gas mixture to an existing CNPRC boiler through an existing underground pipeline. The CNPRC contains a central district energy plant that produces steam for building heating and sterilization and cleaning. The central plant contains two boilers, one of which is configured to burn a mixture of natural gas and biogas/landfill gas. The existing pipeline connected to the boilers was used previously to route landfill gas to the CNPRC prior to the existence of the READ facility. Due to its existing operation, the boiler is not expected to result in new significant air quality impacts.

The minor revision to the project to install a digestate ammonia removal process would generate vapor discharged into the atmosphere. The treated vapor has a flow rate of approximately 400,000 scfd and contains 450 ppmv ammonia. The proposed ammonia removal process would include two small steam boilers. UC Davis is not certain as to which small make/model boilers the proposed process will utilize. UC Davis has a list of three proposed small boilers certified by the South Coast Air Quality Management District (SCAQMD) as compliant with the requirements of Rule 1146.2. The proposed boilers will be approximately 1.6 MMBTU/hr. each (3.2 MMBTU/hr. total) maximum heat input rating. The boilers would comply with Yolo-Solano Air Quality District permitting.

Table 1 summarizes the operation-related emissions of air pollutants as permitted through the YSAQMD biodigester operational permit. As the Table 1 shows, emissions resulting from the operations of the proposed modification would not increase or exceed the YSAQMD permitted emissions. Therefore, the impact from activities associated with the project minor modification would not result in any new impacts or changes to air quality impacts of the proposed Project.

Table 1 Current and Proposed Emissions

	YSAQMD Permitted Emissions Limits (2015)		**Proposed New Emission Limits**	
Pollutant	**Daily (lb)**	**Yearly (tons)**	**Daily (lb)**	**Yearly (tons)**
VOC	15.4	2.81	0.9	0.12
CO	24.5	4.47	24.5	3.15
NOx	14.7	2.68	14.7	1.89
SOx	1.7	0.31	1.7	0.22
PM10	3.4	0.61	3.4	0.43

Biogas Combusted	388,800 (cubic feet)	141.912 (million cubic feet)	388,800 (cubic feet)	100 (million cubic feet)

D. Biological Resources

The Negative Declaration evaluated potential impacts to biological resources at the project site and surrounding area and determined that there were no native plants or animals that would be affected by the proposed project. The revised project would take place on the same site and within existing facilities that was evaluated in the Negative Declaration.

E. Cultural Resources

The Negative Declaration evaluated potential impacts to cultural resources at the project site and surrounding area and determined that there were no impacts by the proposed project. The revised project would take place on the same site and within existing facilities that was evaluated in the Negative Declaration.

F. Geology and Soils

The Negative Declaration evaluated potential impacts to geology, soils and seimicity resources at the project site and surrounding area and determined that there were no impacts by the proposed project. The revised project would take place on the same site and within existing facilities that was evaluated in the Negative Declaration.

G. Greenhouse Gas Emissions

Given the short-term nature (six months) of the construction upgrades and the limited ground disturbance and trenching for the installation of the ammonia distillation system, the revised Project would result in small quantities of GHG emissions. Construction GHG would result from trenching, construction vehicle trips, and construction equipment use. Operational GHG emissions would be generated through water and electricity consumption at the WWTP; although, the new liquid waste digestate treatment system would be more efficient that the old system, resulting in less waste hauler trips to remove the digestate from the site and reduced indirect GHG emissions. Thus, no substantial long-term operational emissions of GHGs would result from Project implementation. Therefore, no new or substantially more severe impacts would occur and no mitigation would be required.

Implementation of the 2018 LRDP, as discussed in 2018 LRDP EIR Impact 3.8-2, would achieve targets established in the UC Sustainable Practices Policy through anticipated planning and policy actions. Achievement of the Sustainable Practices Policy would meet or exceed statewide targets for 2030 and not impede the ability to achieve statewide 2050 targets, including continued implementation of the Sacramento Area Council of Government's (SACOG) Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS).

The modifications to the Project would not result in any new significant short-term or long-term GHG contributions, and would result in improved waste disposal and energy efficiency. Thus the Project would not conflict with University of California Sustainability Practices Policy, the UC Davis Climate Action Plan, SACOG's 205 MTP/SCS, or any other plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The proposed READ GHG emissions are within the overall 2018 LRDP EIR GHG emissions. The proposed READ project changes would not increase the previously evaluated READ emissions. The changes would still be within the 2018 LRDP EIR GHG. Therefore, no new or substantially more severe impacts would occur and no mitigation would be required.

H. Hazards and Hazardous Materials

The Negative Declaration evaluated potential impacts to hazards and hazardous materials at the project site and surrounding area and determined that there were less than significant impact by the proposed project. The revised project would produce materials that are not hazardous in nature and would not be a hazard to the public the same conclusion that was evaluated in the Negative Declaration.

I. Hydrology & Water Quality

The Negative Declaration evaluated potential impacts to hydrology and water quality at the project site and surrounding area and determined that there were less than significant impact by the proposed project. The revised project description does not change the conclusions reached in the Negative Declaration.

J. Land Use and Planning

No revisions have been proposed to the Project as analyzed in the Negative Declaration that would change the land use of the project. The project site and access to stay the same. The revised project would take place on the same site and within existing facilities that was evaluated in the Negative Declaration.

K. Population and Housing

The Negative Declaration evaluated potential impacts to population and housing and determined that there were no new significant impacts by the proposed project. The revised project description does not change the conclusions reached in the Negative Declaration.

L. Public Service

The Negative Declaration evaluated potential impacts to public services and determined that there were no new significant impacts by the proposed project. The revised project description does not change the conclusions reached in the Negative Declaration.

M. Recreation

No revisions have been proposed to the Project as analyzed in the Negative Declaration that would change the recreation impact conclusion of the project. The project site is within a disturbed portion of the former UC Davis landfill that was used for receiving

and weighing waste. The revised project would take place on the same site and within existing facilities that was evaluated in the Negative Declaration.

N. Transportation

No revisions have been proposed to the Project as analyzed in the Negative Declaration that would change the transportation, circulation and parking of the project. The project site and access to stay the same. The revised project would take place on the same site and within existing facilities that was evaluated in the Negative Declaration.

O. Utilities & Service Systems

With the revised project, the digestate that was previously hauled off campus will now be processed at the UC Davis Wastewater Treatment Plant (WWTP). Current design capacity of the wastewater treatment plant is 3.6 million-gallons/day (MGD) for dry weather flow, and 9.4 MGD for peak wet weather flow. There is adequate existing capacity within the WWTP for the digestate to be treated on campus.

V. Conclusion

Based on the foregoing, it is concluded that the analyses conducted and the conclusions reached in the Final ND adopted on June 2012 remain valid. The proposed revisions to the project would not cause new significant impacts not identified in the ND, and no new mitigations measures would be necessary to reduce significant impacts. No changes have occurred with respect to circumstances surrounding the proposed project that would cause significant environmental impacts to which the project would contribute considerably, and no new information has because available that shows that the project would cause significant environmental impacts. Therefore, no supplemental environmental review is required beyond this addendum.