



**Summary of Comments & Responses on the Draft Organic Waste Digestion Project Protocol (September 2009)**

Twenty sets of comments were received during the Draft Organic Waste Digestion (OWD) Project Protocol's 35-day public comment period. Staff of the Climate Action Reserve worked to respond to these comments.

In order to keep this summary document to a reasonable size, comments were edited for length. The comment letters can be viewed in their entirety on the Reserve's website: <http://www.climateactionreserve.org/how/protocols/protocols-in-progress/co-digestion-project-protocol/>

**Comments were received from:**

1. AECOM (AECOM)
2. Californians Against Waste (CAW)
3. California Refuse Recycling Council (CRRC)
4. California Integrated Waste Management Board (CIWMB)
5. ClimeCo America Corporation (CC)
6. Dublin San Ramon Services District (DSRSD)
7. East Bay Municipal Utility District (EBMUD)
8. Element Markets (EM)
9. Fluid Components International LLC (FCI)
10. Greenhouse Gas Services (GHGS)
11. International Engineering Services, Inc. (IES)
12. Los Angeles County Solid Waste Management Committee (LACSWMC)
13. Microgy, Inc. (M)
14. Pacific Gas and Electric Company (PGE)
15. Richardson Smith Gardner and Associates (RSG)
16. Sacramento Municipal Utility District (SMUD)
17. Storm Fisher Biogas (SFB)
18. Terra Pass (TP)
19. Verdeo Group (VG)
20. Ze-Gen, Inc. (ZG)

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## General Comments

1. We would like to see some clarification regarding how developers can prove that greenfield projects meet the performance standard. For greenfield projects where there was no prior wastewater management, project developers should have to demonstrate that it is common practice in the region to manage wastewater in uncontrolled anaerobic conditions. **(EM,GHGS)**

**RESPONSE: Agreed. Language has been added to clarify when Greenfield projects are considered to be eligible.**

2. In general we are pleased with the draft protocol as it is written, and appreciate the willingness to incorporate and consider language that we provided. **(CIWMB)**

**RESPONSE: Noted.**

3. Regarding project complexity and size thresholds. We recognize the Reserve's desire to require robust and verifiable evidence of project operations. The intention of these efforts is to ensure against material or significant errors in the issuance of CRTs (especially over-crediting). We encourage the Reserve to view the requirements for metering, monitoring, sampling and verification in the context of overall project size and the relative risk and magnitude of errors. Requiring smaller projects to have the same metering and sampling procedures as very large projects is detrimental to those small projects in several ways. Foremost, they may result in small projects being financially infeasible (both due to equipment and verification costs). They also may require extraordinary measures to control against errors equivalent to very small numbers of CRTs. As a specific example from the OWD protocol, we call your attention to the requirement on page 35 that digester effluent flow be metered and sampled quarterly for chemical oxygen demand. For a livestock facility co-digesting a few hundred gallons of whey per month these requirements are onerous to the point of being prohibitive and may only result in correcting a variance of the model value from the actual value of a few hundred tons per year. We strongly encourage the Reserve to consider adopting project size thresholds which would simplify metering, sampling, monitoring and verification requirements for small facilities, thereby encouraging a greater adoption of these projects around the country. **(TP)**

**RESPONSE: Noted. The Reserve understands the argument for having a project size threshold approach for metering, monitoring, and verification requirements, and may consider this option. Because this approach would likely apply to other project types, this approach will not be built into Version 1 of the OWD protocol, but will be considered in the context of refining general program policies.**

## Requested Feedback – Local Government Food Waste Diversion Mandates and the Regulatory Test

4. We support the inclusion of a local government food waste diversion mandate exception for projects that require a local food waste diversion mandate in order to ensure feedstock for the project. The Reserve's rationale that potential projects might not get started without these diversion mandates in place is a sound one. Moreover, a

project developer will most likely not commit to a project until after such mandates are passed. However, the requirement that such a project be operational no more than 12 months after the passage of local mandate is counterproductive. Digester projects are likely to require more than 12 months to implement. We would ask that you consider a 24-36 month window for a project to become operational. (CIWMB, CAW, SMUD, EBMUD)

**RESPONSE: Noted. The Reserve is hesitant to increase the local mandate exception window of opportunity beyond 12 months (before and after), as this may increase the risk of registering projects that are acting only in response to regulation (i.e. non-additional projects). However, the Reserve will re-define the criterion such that the project developer must demonstrate only that the project has been initiated within a 6month window starting with the passing of a local mandate. Thus, the project does not have to be fully operational within 6 months following the passage of a local food waste diversion mandate. The Reserve will adjust the language and provide guidance to project developers for demonstrating project initiation.**

5. We believe local food waste mandates should not impact the regulatory test for additionality. The current situation is that the vast majority of food waste is currently being disposed in landfills, and 20+ years of local and statewide waste diversion efforts have not put a major dent in this. Any local efforts to make organic waste diversion projects more feasible should be encouraged. (CAW, CRRC, SFB, EBMUD)

**RESPONSE: Noted. Ignoring local mandates altogether when assessing the additionality of OWD projects is a policy that is not consistent with the Reserve's principle of crediting only those activities that go above and beyond what is required by law. However, the Reserve acknowledges that local food waste diversion mandates may be a necessary component of successful OWD project implementation in some cases. See response to comment #4.**

6. We would like to see language that allows flexibility in the event that a local mandate is changed (i.e. expanded to require diversion of additional feedstocks). In these instances, the protocol should treat a modified mandate as a new mandate which would reset the "clock" on which projects would be allowed under the Regulatory Test. (CIWMB)

**RESPONSE: Noted. Under the protocol, any modification to a waste diversion mandate would be treated as a new mandate. This means that if the modification occurred more than six months after the project's initiation, the waste stream addressed by the modification/expansion would be deemed ineligible.**

## **Requested Feedback – The First Order Decay (FOD) Model Crediting Schedule**

7. We favor and support the approach of limited upfront crediting of the methane reductions in the year that the actual methane destruction occurs, as is proposed in the draft OWD protocol. We agree with the Reserve that there is little risk to this approach and such a crediting framework will make it easier for financing institutions to extend credit to projects, incentivizing more project developers to come into the market. The conservative discounts built into the quantification approach combined with the annual

verification of methane destruction render the likelihood of issuing credits that would later be reversed or deemed ineligible to be extremely low. (CIWMB, CRRC, SFB, CAW, TP, VG, ZG, PGE)

**RESPONSE: Noted. The Reserve agrees. The limited upfront crediting approach outlined in the Draft protocol will not be altered.**

## 1 Introduction

No comments received.

## 2 Project Definition

8. The third paragraph of section 2.1 only references the co-digestion of eligible organic waste streams with manure. Page 74 of Appendix C then describes co-digestion of bio-wastes at wastewater treatment plants (WWTP). Could you please clarify/add that co-digestion of eligible organic waste streams can be performed with municipal sludge as a primary feedstock in existing or new digesters at WWTPs besides manure? (AECOM)

**RESPONSE: Co-digestion of eligible waste streams along with municipal biosolids (sludge) is allowed, however municipal biosolid streams are not eligible for crediting, therefore the digestion of biosolids will not generate additional GHG reduction credits.**

9. Projects that thermally process or digest biosolids (sludge) should be included in the project definition and sludge should be eligible if it can be demonstrated that it was previously going to landfill. (RSG)

**RESPONSE: Noted. See response to comment #8. Municipal biosolids are not included as an eligible waste stream because it is already a reasonably common practice to aerobically treat or anaerobically digest this waste stream per the Performance Standard analysis performed for this protocol (see Appendix C).**

10. Does the Reserve plan to include aerobic composting and/or thermal processing projects under a separate protocol? (RSG)

**RESPONSE: The Reserve will continue to explore other waste diversion activities such as composting and thermal processing for future protocol development. If the Reserve chooses to move forward with developing a protocol for these activities, it is likely that a separate protocol would be developed for each separate activity.**

11. Our main concerns regarding Version 1 of the Draft Protocol is the very conservative limits placed on the Project Definition and Eligible Waste Streams. We would like to see the Project Definition expanded to include co-digestion with sewage sludge in addition to co-digestion with manure. (SMUD)

**RESPONSE: Noted. See response to comments #8 and #9 above.**

12. Existing (post 2001) wastewater treatment plants that are in compliance with all local, State and Federal discharge regulations that are operating per an extended aeration process can be included in the program when digesters are added. (IES)

**RESPONSE: Noted. See response to comments #8 and #9 above.**

13. One of the benefits of A-D projects is the creation of biogas that can be utilized for electricity or thermal energy. We are concerned that the protocol does not allow for the beneficial use of biogas. (LACSWMC)

**RESPONSE: The protocol is technology neutral, meaning that any gas destruction method is allowed as long as the final fate of the methane is destruction. However, the protocol credits only the destruction of methane, and does not provide additional credit for the displacement of fossil fuels. The Reserve has a standing policy to not credit activities that displace fossil fuels because of the potential for double counting the resulting GHG emission reductions and the likelihood that fossil fuel emissions will be capped in the United States in the near future.**

## 2.1 Project Developer

### Ownership of Indirect Reductions

14. The term “waste providing entity” needs to be better defined and made more amenable to the kinds of relationships existing in the solid waste industry. Specifically referring to the onerous nature of requiring contracts with each individual restaurant, grocery, or neighborhood. Also, often times waste is brought to the digester by a waste hauler who is contracted with the customer that is the waste producing entity. In this scenario the developer has no contact or relationship with the actual waste producer/supplier. (CRRC, EBMUD)

**RESPONSE: Agreed. The language in the protocol has been revised to better reflect the kinds of relationships existing in the solid waste industry. See response to comment #15.**

15. Legal agreements addressing GHG rights are not typically executed between waste suppliers and digester operators. Can ownership be addressed by attestation? (RSG)

**RESPONSE: Noted. The Reserve will rely on the Attestation of Title document to ensure that GHG reductions resulting from the project are rightfully owned by the project developer. The language regarding legal agreement requirements will be removed.**

## 3 Project Eligibility

### 3.1 Location

16. Location criteria should specifically state tribal lands. (IES)

**RESPONSE: Noted. The protocols are applicable to tribal lands and US territories.**

### 3.2 Start Date

17. The project start date of 1/1/ 2001 ignores proactive and often capital intensive efforts made by agencies prior to this arbitrary cut-off date. We suggest the project start-date be revised to 1980 at the earliest. (DSRSD)

**RESPONSE: Noted. The Reserve must ensure that eligible projects are additional, i.e., they would not have happened in the absence of incentives created by a carbon offset market (see the Reserve's Program Manual for further discussion of additionality). If a project was implemented before the existence of such carbon offset markets, it is highly likely that the project is not additional. A start date prior to 2001 would not ensure the additionality of projects registering with the Reserve**

### 3.3 Crediting Period

18. We are concerned that the curtailment of the project crediting period due to future regulations may not provide the necessary certainty to be able to rely on this funding stream to finance a project. Given this project risk, these types of projects may have significant difficulty being developed. We would encourage the Reserve to consider mechanisms to ensure some level of crediting certainty to ensure that good projects can be funded today, rather than waiting for potential future regulations. It is recommended that the Reserve modify the policy regarding failure of the Regulatory Test to bring this protocol into alignment with the Reserve Livestock Protocol, which guarantees a 10 year crediting lifetime for a project regardless of changes to regulation. (SMUD, VG, CC,ZG)

**RESPONSE: Noted. The Reserve assesses the risk of guaranteeing a fixed crediting period on a protocol-by-protocol basis. This is to protect the credibility and value of CRTs in the marketplace, and the reputation of the Reserve (which influences the value of CRTs in the marketplace). We believe the regulatory context for OWD projects is significantly different from that facing livestock projects, and for that reason believe a different policy is warranted.**

**From an investment and market development perspective, the arguments for guaranteeing the issuance of offset credits for a fixed period are compelling. However, as a non-profit organization operating in the voluntary carbon market, the Reserve does not have the legal authority to implement mechanisms to guarantee the value of credits that are manifestly not additional (i.e., credits issued for emissions reductions that are required by law) or that would be double-counted against an emission cap. Only government policymakers and regulators have this authority.**

**Further, even if the Reserve were to issue CRTs after the implementation of a regulatory requirement, such CRTs would likely have very little market value, and zero credibility as emissions offsets. While the Reserve would support regulatory guarantees that uphold the value of voluntary offsets, we cannot credibly provide this sort of guarantee ourselves.**

19. Section 3.2 of the draft OWD protocol states that projects may earn credits for up to 10 years after eligible material is first digested (including manure) in an operational Biogas Control System. The Reserve may want to consider allowing projects to allow earning for more than the 10-yr period as diverting food waste to OWD projects requires

significant ongoing expenses and may not be common practice even at the end of the 10-yr period. It is recommended that the Reserve consider creating parameters for extending project lifetimes. (PGE)

**RESPONSE: Agreed. We have revised the protocol language to allow projects to apply for a second crediting period by demonstrating that they meet the eligibility requirements of the most current version of the OWD protocol.**

### 3.4 Additionality

#### 3.4.1 Performance Standard

20. Please add to the Text Box on page 7 as additional Eligible Organic Waste Streams, the terms source separated organic waste (SSO) and non-source separated waste (mixed MSW) where the organic fraction of MSW (OFMSW) can be digested or co-digested. (AECOM)

**RESPONSE: Noted. The Reserve will clarify the language as is appropriate.**

21. We noted that Appendix C recommends Meat and Poultry processing and Vegetable processing be included as eligible OWD project types. As it does not appear that solid wastes from these processes are eligible for the OWD protocol, the Reserve should “fast-track” development of a protocol to address these processes. (PGE)

**RESPONSE: The performance standard recommendation is to include waste-water generated at meat and poultry processing and vegetable processing operations, however the recommendation for solid waste materials is to include only MSW food waste, which does not include the solid material from meat and poultry or vegetable processing because the majority of this material typically has an economic value as a re-usable product. The Reserve will continue to research animal slaughtering wastes in order to determine if this waste stream may be appropriate to include as an eligible waste stream. However, Version 1.0 will not include this category of waste as an eligible solid waste stream.**

22. The Protocol as written today is too restrictive as to what types of substrates will qualify for methane off-set credits. I believe that the attempt to simplify the protocol has narrowed the window of qualified materials so greatly that it may limit participation of development companies in registering their projects with CAR. There are many non-hazardous organic materials that are being disposed of in landfills. These materials include: sewage sludge, grease trap waste, meat and fish processing wastes, rendering wastes, glycerin, yard waste, and other food processing material for primary food manufacturing. These materials are disposed of in landfills and all have significant methane emission potential. We suggest modifying the OWD protocol to include a “burden of proof mechanism” for non-listed organic waste materials. (M, CAW, LACSWMC)

**RESPONSE: Noted. The Reserve defined the performance standard and the eligible waste streams conservatively based off the information and data available at the time research was conducted in early 2009. The goal of the performance standard eligibility assessment is to include only waste streams for which the act of diverting the material to an A-D system constitutes a practice that goes above and beyond business-as-usual GHG management**

practice. Obviously, there is a large degree of regional and sectoral variation in the way certain potential waste streams are commonly treated/disposed, and the Reserve will continue to perform research on some of the materials that are currently non-eligible in order to assess whether it is possible to include additional materials (possibly on a state- or region-specific basis).

The Reserve is committed to a program-wide policy of developing standardized protocols for offset quantification and verification. This means that Reserve protocols do not incorporate project-specific “burden-of-proof” procedures for justifying alternative quantification measures or determining additionality. For more on the rationale for this policy, please see the “Additionality” section of the Reserve’s Program Manual.

23. Regarding yard waste, the protocol quotes an EPA estimate of yard waste diversion of 64%. This estimate average is then used to conclude that the diversion of yard waste from landfills is common practice. However, diversion of yard waste is disproportionately small (in some cases below 10%) in many parts of the country. The protocol should allow for a county or statewide assessment of yard waste diversion. If a project can demonstrate that the state or county predominantly disposes of yard waste at landfills, then yard waste originating from that county or state should be eligible to earn methane reduction credits. According to the EPA environmental fact sheet, only 12 states have a ban on yard waste. This approach should also be allowed for agricultural wastes (as defined in the Federal Incinerator Regulation) (CC)

**RESPONSE: Noted.** The Reserve believes the EPA environmental fact sheet referenced may be out of date, as it is our understanding that almost half of U.S. states currently have some sort of ban on landfilling of yard waste and/or green waste materials. The Reserve acknowledges that there is considerable regional variation in the way yard waste is disposed, however we can not include yard waste as an eligible waste stream until an understanding of the drivers for the regional variation and diversion rates are better understood. See response to comment #22.

24. Regarding Eligible Waste Streams, the elimination of FOG waste and liquid food processing waste is problematic, as it will render most of the wastewater treatment plant projects ineligible, and will also limit the potential for co-digestion on farm. While collection practices for FOG and liquid food processing waste must be adjusted to support co-digestion projects, they often require less adjustment than the co-digestion of food waste which in nearly all California jurisdictions will require the wholesale development of new collection programs. Thus, we believe that FOG and liquid food processing waste are more suitable waste streams to minimize the costs of co-digestion projects. The Draft Protocol’s requirement that a waste stream has to have been disposed of at a landfill in order to establish a baseline is inappropriate for this type of waste stream, and thus overly limiting. (SMUD)

**RESPONSE: Noted.** As this is an avoided methane protocol, it is not appropriate to provide GHG reduction credit under this protocol for digestion of materials that would not have produced and emitted significant amounts of methane to the atmosphere in the absence of the project. Thus, the Reserve imposes the requirement that eligible solid waste streams must have been previously disposed of at a landfill, and eligible wastewater streams must

have been previously treated in an open anaerobic system. Regarding FOG wastes, the Performance Standard assessment determined that FOG wastes are commonly re-used and/or treated in systems that minimize the release of methane to the atmosphere. Regarding liquid food wastes (i.e. wastewater from food processing), this stream is potentially eligible if it was treated in an open anaerobic system prior to project activity.

25. Some materials may be co-mingled with food waste MSW (for example, soiled paper napkins, pizza boxes etc.). Are these material considered eligible? (RSG)

**RESPONSE:** These materials are not eligible, and should not be quantified as food waste. However it is probable that there may be some contamination of the food waste stream. The FOD model contained in the protocol incorporates appropriate conservative discount factors to account for the uncertainties due to small amounts of non-food waste contaminating the food waste stream.

26. It is not clear why the CAR OWD protocol should exclude any agro-industrial wastewaters from eligibility, provided that during verification it can be confirmed that the baseline management of these wastewaters was open lagoon management without gas collection. Any wastewater that is managed under open lagoon conditions but is found to be ineligible would be a false negative for the performance standard and the protocol would fail at being a tool to mitigate those GHG emissions. During the development of the “performance standard” it was identified that the aforementioned industries sometimes use anaerobic digestion as a means of wastewater treatment. It was not clear that a truly representative sample was taken to build an argument to exclude these waste types. Although very large facilities (especially breweries) may commonly have A-D systems, smaller facilities often do not have the economy of scale necessary to justify the installation of an A-D system. The OWD protocol should subject all wastewater streams to the same strict baseline evaluation requirements to determine eligibility. Upon verification, project developers would have to demonstrate on a feedstock-by-feedstock basis that the baseline wastewater management was uncontrolled anaerobic conditions (open lagoons). By doing so, the protocol would insure that only target feedstocks with eligible baselines would be credited. Any waste stream that had been going to an anaerobic digester (or any other ineligible management type) prior to the CAR program cut off date would be ineligible. (GHGS, SFB)

**RESPONSE:** The wastewater industry exclusions are intended to ensure that OWD projects that register with the Reserve are projects that are going above and beyond business as usual for that industry. Certain industries have been excluded from eligibility due to evidence that it is already a reasonably common practice to treat their wastewaters in A-D systems. The Reserve understands that there is likely regional variation and facility size variation for these industries; however the Reserve must continue to exclude these industries until such time as the A-D market penetration and common practice wastewater treatment variations are better understood. Please see response to comment #22.

### 3.4.2 Regulatory Test

27. We acknowledge that ensuring that a project is in surplus to regulatory mandates is a key component of assessing additionality. However, the figures for national adoption of food waste diversion make project-level assessment unnecessary at this time, as the 3 %

diversion rate is so far below what could be considered common practice that all food waste diversion projects should be considered regulatory surplus at this time. The level of adoption of food waste diversion can and should be assessed each time the performance standard is re-visited. (TP)

**RESPONSE: Noted. Although waste diversion regulations may be uncommon, ignoring them when assessing the additionality of OWD projects would not be consistent with the Reserve's policy of crediting only those activities that go above and beyond what is required by law. The fact that such regulations are rare does not mean that they fail to dictate standard practice where they do, in fact, exist.**

28. To maintain eligibility under this protocol the Reserve proposes that and OWD project must consistently digest at least one eligible waste stream. This is inconsistent with the requirements under the performance standard section that at least one eligible organic waste stream must be consistently, periodically, or seasonally digested. Please clarify. (SMUD, TP)

**RESPONSE: The language will be clarified.**

29. Regarding state-wide mandatory diversion targets, we believe that this regulatory test is unnecessary and duplicative. The fact that only 2.6% of food waste is diverted from landfills means the common practice test has already been met. We recommend removing the landfill diversion target regulatory test from the protocol. (VG)

**RESPONSE: Noted. However, state diversion targets that impose penalties on jurisdictions for non-compliance do provide regulatory driven incentive to divert materials in order to meet the imposed target. Therefore there is a strong regulatory incentive to divert food waste, a substantial component of a municipal waste stream. See response to comment #27.**

30. Section 3.4.2.1 erroneously states that North Carolina has a diversion target similar to AB939 in California. Although NC has general goals in place, no mandatory diversion targets are in force in NC. (RSG)

**RESPONSE: Thank you for pointing this out. The language will be corrected.**

### 3.4.3 Environmental Compliance

31. The wording in this section is vague, and too broad. We suggest a revision to clarify that non-compliance refers to violations that result in unmitigated damage to the environment. The language should also define the period of non-compliance as starting on the date specified in the notice of violation, and ending on the date of response by the permittee. (RSG)

**RESPONSE: Noted. The language in this section is consistent with other Reserve protocols. Clarification may be provided in future updates to the protocol, as necessary.**

## 4 The GHG Assessment Boundary

32. When co-digesting eligible organic waste streams at WWTPs, a good portion of the filtrate of the liquid/solid separation may be recycled back into the organic waste pre-treatment or treatment process and/or sent to the headworks of the WWTP for further treatment. For clarification I suggest adding a textbox in Figure 4.1 stating that the

liquids from the solid/liquid separation goes to a wastewater treatment process -outside the GHG Assessment Boundary- before it is discharged. (AECOM)

**RESPONSE: Agree. This will be clarified.**

33. Table 4.1, SSR 12 – the quantification box is missing, this SSR should be metered. (FCI)

**RESPONSE: Agree. Thank you for pointing this out.**

34. We are concerned that the GHG assessment boundary has been drawn to include emissions from off-site treatment of digestate, but not the subsequent GHG benefit from the use of composted materials. This does not represent a realistic analysis and understates the emission reductions. (CAW)

**RESPONSE: The GHG assessment boundary was drawn in a conservative manner. The GHG benefits from the use of composted materials constitutes a separate GHG reduction activity, and therefore it is not appropriate to include benefits from the end-use of compost when assessing the GHG impact from an OWD project. It is consistent with best-practice GHG accounting to account for significant secondary increases in GHG emissions associated with a project activity, but to exclude secondary GHG reductions, as a way to avoid overestimating GHG reductions.**

## 5 Calculations

### 5.1 Baseline Calculations

35. Please add to the definition of MSW Food Waste the terms source separated organic waste (SSO) and non-source separated waste (mixed MSW) where the organic fraction of MSW (OFMSW) can be digested or co-digested.(AECOM)

**RESPONSE: Noted. The definitions will be clarified as is appropriate.**

#### Food Waste Baseline Emissions

36. We recommend that the Reserve use a 100 year time horizon for calculating the emissions from landfilled waste, in line with the EPA LandGEM model. We believe that using a period of 10 years is overly conservative, and may set a dangerous precedent for all avoided landfill protocols in the future, specifically for wastes that decay slower than food waste (i.e. wood). In order to incentivize the diversion of slower decaying wastes from landfills, the Reserve must include a longer decay window or food waste projects will be favored at the expense of other organic waste streams that have equal or greater overall GHG emission impact. (ZG)

**RESPONSE: Noted. However, given the uncertainties inherent in modeling avoided emissions into the future (largely in relation to uncertainties associated with the parameters of the model and landfill dynamics), the Reserve is uncomfortable projecting avoided emissions further than a 10 year time horizon for diverted material. The length of time that avoided emissions may be credited is determined on a protocol-by-protocol basis.**

37. We believe that the 10 year time horizon for calculating emissions from landfilled waste is overly conservative. We suggest a time horizon of 50 years, which would still be

highly conservative given that the assumption could be made that the landfill has a LFG collection system with 75% collection efficiency for the entire 47 years following the 3 years where gas is not collected. This is conservative because most landfills only maintain gas capture systems for the first 15 years after a cell is closed. The large “haircut” from applying the 75% collection rate for years 19-50 would dwarf any baseline uncertainty that exists. (VG)

**RESPONSE: See response to comment #36.**

38. Regarding pre-project composting activities, considerable time can be required to develop an effective food waste diversion program and to fully implement the digester project. It might be financially advantageous to have a viable food waste stream available when the A-D facility begins operation. Thus, it may be prudent for to initiate food waste diversion before the A-D facility is operational. In this case, the food waste may be temporarily sent to a compost facility with excess capacity to manage the food waste during this interim period. Language should be used that allows for this scenario and does not penalize the project. (CRRC)

**RESPONSE: Noted. The protocol has been amended to indicate that pre-project composting levels must be quantified for an entire year prior to the project start date. Temporary diversion of waste to composting facilities prior to completion of a biogas control system will in most cases not significantly affect the annual total used as a baseline for composting.**

39. Regarding the  $DOC_f$  factor in equation 5.4: the default value used (0.5) is the value suggested by IPCC to be used for mixed MSW. A more accurate food waste specific value is used by the US EPA WARM model. Based on the data provided in the WARM documentation, using the 0.5 default value for  $DOC_f$  underestimates the landfill emissions from food waste by about 35%. There is currently enough scientific knowledge about this parameter to provide a more specific default value. Also, the description in the equation needs to be improved to better describe the parameter in line with the IPCC definition. (CRRC, CAW)

**RESPONSE: Agree. The  $DOC_f$  value will be updated to reflect a food waste specific value, and the description of the  $DOC_f$  term will be clarified.**

40. Regarding the 75% collection efficiency, we believe this number is inappropriately high for an average landfill gas collection system given the extreme variation of practices regionally. Projects should have the opportunity to demonstrate on a project specific basis if the waste would have gone to a landfill with no collection system in place. (CAW)

**RESPONSE: Noted. The Reserve agrees that there is considerable variation in estimates of landfill gas collection efficiencies given the lack of data and the substantial variation in technologies used at landfills. However, the Reserve feels that the EPA established default value of 75% is appropriately conservative given the lack of scientific agreement on this value. The Reserve will continue to monitor developments in the understanding of landfill gas collection system efficiencies.**

## 5.2 Project Calculations

### Project Emissions From the Biogas Control System

41. Replace the word “will” with “may” in the following sentence of the first paragraph: “...and the destruction devices) may be a significant source of methane emissions...”. Whether or not a biogas control system may be a significant source of methane emissions is dependent upon its operational performance and control efficiency. (AECOM)

**RESPONSE: Agree. Language changed.**

42. When determining the “aggregated monthly” SCF/month value of biogas flow (equation 5.10) can we use a universal 30 day month, or must the actual number of days per month be used. (FCI)

**RESPONSE: The actual days in the given month must be used.**

### Project Emissions from Anaerobic Disposal of Digestate produced on the digestion process

43. Successful digestion or co-digestion of SSO or OFMSW requires effective removal of contaminants (plastics, stones, grit, metals, batteries, etc.) in the pre-treatment process. The level of contamination in the waste stream may vary and a certain amount of organic matter remains in the removed contaminant stream. The amount of organic matter that is remaining in the removed contaminates is dependent upon the technology applied for contaminate removal. Depending upon the contaminant removal process a certain portion of the removed contaminants may be used for beneficial use (for example removed fine grit could be used as construction material). The majority of the removed contaminates (with residual organic matter attached) may need to be disposed of in landfilled or other means of disposal (e.g. thermal treatment). The residual organic material that is landfilled will need to be accounted for as well besides the digestate disposal scenario described in this section. (AECOM)

**RESPONSE: The Draft protocol requires projects to assess the quantity of “rejected feedstock” that is returned to the landfill prior to being digested. This quantity will be subtracted from the total weight of material that was weighed upon entering the facility. Language will be edited for clarity.**

### Project Emissions from Manure Treatment Systems

44. Please explain this emission source, possibly with an example. (TP)

**RESPONSE: Agree. Language will be amended.**

## 6 Project Monitoring

45. The protocol requires a developer to directly monitor and record the daily volume of digester effluent wastewater that exits the digester prior to entering the effluent storage pond. In above ground digesters, it is usually very simple to measure both influent and effluent wastewater. However, covered lagoon digesters often times do not have the capability to measure effluent leaving the lagoon. For these covered lagoons, all the wastewater entering the lagoon must eventually exit, thus using the measured influent volume, as required by the protocol, should be sufficient. In addition, the effluent volume will most likely be less than the influent volume, so using the same flow data is ultimately more conservative when calculating the project emissions. It is recommended that CAR only require project developers to monitor the wastewater entering the digester and give developers the option of using this value for representing the discharge as well. (EM,GHGS)

**RESPONSE: Agree that the value would be conservative. The language has been amended.**

46. Given the large players in the waste disposal sector, sourcing materials for digestion projects is a competitive and challenging task. The requirement that the waste source annually complete a survey (found in Appendix E) presents an additional barrier to securing the necessary materials for digestion. We suggest requiring an initial survey from each supplier, but not an annual survey. (SFB)

**RESPONSE: Agree. Based on feedback, the Reserve does not feel that requiring surveys will be a productive way to track eligible waste streams. The surveys requirements have been removed.**

47. COD monitoring of Agro-industrial wastewater and digester effluent prior to entering the digester or storage pond, and prior to the mixing of other effluent streams may not be required under many facilities permits. Typically, monitoring is performed on treated effluent prior to discharge to a stream or municipal wastewater treatment system. We suggest a revision to allow for projects to demonstrate compliance with permitted monitoring requirements for historic periods in the absence of COD measurements. (RSG)

**RESPONSE: The COD monitoring is absolutely necessary in order to quantify the avoided methane emissions from the digester project. Reductions are not quantifiable without measured COD records.**

48. We strongly support the shift, across multiple protocols, to meter calibration requirements that are more in keeping with the suggestions from manufacturers of that equipment. We have several further recommendations as it relates to meter calibrations. First, calibration requirements are not listed for methane analyzers. We recommend that manufacturer guidance should also be relied upon for these devices. Further, it has been our experience in multiple projects that from time to time the required periodic calibration, field check, inspection and cleaning events do not occur at the scheduled time. Many devices and the equipment used in their calibration are able to perform “as found” tests which provide rigorous evidence of reading errors. We suggest that the Reserve provide guidance for circumstances where a meter has missed a scheduled calibration but an “as found” check or calibration finds the device to be

within acceptable tolerances. To be clear, this is a different circumstance than a “failed calibration” described in the protocol and Appendix D. As the protocol currently reads a project that is late in performing a calibration but has meters that function properly could be issued fewer credits than a project with meter drift that is checking or calibrating on schedule, which does not seem to be a result in keeping with the Reserve’s goals. (TP)

**RESPONSE: Noted. Guidance will be given for methane analyzers. The Reserve will also provide guidance for missed calibrations as well as failed calibrations.**

49. This protocol requires that projects monitor the hourly operational activity of gas destruction devices. This requirement seems unnecessary in most instances as the majority of destruction devices covered in these protocols, including generators, boilers, and many flares cannot accept gas if the device is not working properly. Thus there is no risk of venting from these devices. We suggest that if a destruction device can be verifiably demonstrated to be “closed” to gas flow when it isn’t operating, then hourly records of operation are unnecessary. (TP)

**RESPONSE: Noted. The Reserve will explore this option for some destruction devices; however it is the feeling of staff that a better understanding of these devices is needed before this approach is adopted. Version 1 of the OWD protocol will not be changed at this time, but this issue will be explored further in the context of general metering requirements for all Reserve methane protocols.**

## 7 Reporting Parameters

50. In the bulleted items on page 50, please clarify that projects need to maintain copies only of permits related to the project. (TP)

**RESPONSE: Agree. This will be clarified.**

## 8 Project Verification Guidance

No written comments received.

## 9 Glossary of Terms

51. MSW Food Waste – Please add to this definition for clarification the terms source separated organic waste (SSO) and non-source separated waste (mixed MSW) where the organic fraction of MSW (OFMSW) can be digested or co-digested. The terms SSO and OFMSW have been more commonly used in Europe rather than food waste. Please note that the term “bio-waste” (or: biowaste) used in Appendix C of SAIC’s report (page 74) is commonly used in Europe and describes SSO along with smaller amounts of digestible yard wastes such as grass clippings and leaves. (AECOM)

**RESPONSE: Terms will be clarified as is appropriate.**

## Appendix C: Performance Standard Research

52. Would it be possible to receive a copy of SAIC’s “Performance Standard Paper”? I am particularly interested in reviewing background information used to determine the cost

figures provided and discussed under the Section titled “Digestion Economics”. What are the sources used to determine the cost figures provided in Table C.2.? The capital costs, for example, shown for anaerobic digestion of MSW appears to be on the low end. **(AECOM)**

RESPONSE: Yes. We can provide a copy upon request. There were numerous sources for this section, and as is often the case with financial feasibility estimations, there is likely considerable spread in estimates of costs.