

**TerraPass Inc. Comments on the
Climate Action Reserve Draft Landfill Protocol Version 4.0
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We appreciate the opportunity to comment on the proposed protocol. Our comments are divided into comments on the performance standard analysis, and comments on the protocol's specifics.

Performance Standard Comments

EPA's Landfill Methane Outreach Program Database

Since the LMOP database serves as the basis for the performance standard, and since the proposed standard uses LMOP data in a quantitative way (e.g. not only examining numbers of projects but examining quantitative data about each project), it is important to understand and account for the accuracy and robustness of the dataset, as any analysis based on this data can only be as accurate as the underlying dataset.

The EPA's LMOP program website states that "The information contained in the LMOP database is compiled from a variety of sources, including annual voluntary submissions by LMOP Partners and industry publications". It is also our understanding that the EPA does not reach out to landfill owners in any systematic way (e.g. send inquiries to lists of landfills supplied by state agencies) to gather initial data, nor to ensure that the data supplied is accurate or up-to-date. The EPA's website goes on to say, "Due to the limitations of voluntary reporting, LMOP cannot guarantee the accuracy of these data." These limitations suggest at least a cursory examination of data quality is in order. It does not appear to have been completed by CAR staff, so we have completed a very basic analysis here.

Anecdotally, the analysis as written by CAR staff raises immediate questions about the data's accuracy. For example, the staff analysis notes that the database contained 687 NSPS landfills in 2007, and that it contains 382 NSPS landfills today. Yet landfills do not "graduate" or "drop out" of NSPS status. Indeed, the database grew in total size over this period. What happened to the other 300 NSPS landfills? The EPA does not drop landfills off the LMOP database to the best of our knowledge. Is NSPS status a guess or estimate by EPA staff or the Reserve staff? If so, upon what is that estimate or guess based and why would it change so dramatically over 4 years?

Quantitatively, we performed a quick check on waste-in-place data, since that data becomes important in CAR's analysis. Specifically, we took a copy of the database downloaded in February 2008 (the earliest copy we had on hand), and used a random number generator to pick out 5 landfills. We then looked these landfills up on the database as downloaded June 3, 2011. Of the 5:

- 1 was reported closed in the 2008 report and was still reported closed in 2011, with all the same data;

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- 1 was reported open and accepting waste and was reported as having a higher waste-in-place in 2011 vs. 2008;
- 2 were reported open and accepting waste and had the exact same quantity of waste-in-place in both reports; and
- 1 was impossible to match from the 2008 data to the 2011 data, such that if the same landfill was on both databases (its name had changed, but if we use location as the indicator) then both sets of data cannot be correct because non-transient data such as “date landfill opened” had been changed from 2008 to 2011.

In the rosier view of this sampling, 40% of the data we selected for waste-in-place is incorrect in 2011, with a probable skew toward under-reporting since the data in these cases was static though the landfills were growing.

With this very basic analysis, we conclude that the EPA’s LMOP database is not at all robust when taken at face value, and raises significant questions regarding its suitability for quantitative analysis. As discussed in more detail below, CAR could use statistical sampling techniques to quantify and then account, at least in part, for the large uncertainties inherent in the underlying data. We submit that not to do so creates an unreliable analysis, especially since CAR makes large simplifying assumptions prior to using the quantitative data, introducing significant uncertainties before the data is considered.

Simplifying Assumptions

The Reserve staff makes several simplifying assumptions in its use of LMOP data. Among these assumptions (excluding NSPS landfills) are:

- Landfills with flares but no energy or carbon projects were obligated by regulation to install the flares;
- Landfills with energy projects were not obligated by regulation to install gas destruction systems; that is, these systems are entirely voluntary; and
- Landfills with energy projects that are not listed on carbon registries did not require the financial incentives required by carbon revenue to be “viable.”

While acknowledging that these are simplifying assumptions, the analysis makes no attempt to confirm or establish uncertainty bounds around the accuracy of these assumptions, and after stating them the analysis treats them as fact, down to the second decimal point. Especially important is the second bullet; the performance standard’s analysis relies heavily on the assumption that all landfill gas-to-energy projects at non-NSPS landfills are, by definition, installed for voluntary purposes unrelated to environmental conditions and regulations affecting the landfill.

Based on our work with dozens of landfills, we do not believe this assumption to be correct. We encounter many landfills with energy projects that were able to attract those projects *specifically because* a flare-based destruction system was required and installed prior to the energy project’s installation. (Existing flare-based destruction systems are especially attractive to energy developers because gas flow - even if somewhat low - is known and takes significant risk off the table.) These cases suggest that there are often reasons an energy project would be installed at a site with a required gas destruction system, contrary to the assumption above.

As a specific example, landfills in the Bay Area Quality Management District’s jurisdiction have been required to install landfill gas collection systems at the 1-million ton threshold for many years. Landfill

gas-to-energy plants at such landfills benefit from the improved risk profile and lower cost of installing an energy plant on top of a regulatory gas collection system.

Given (at least anecdotal) evidence that the assumption that all gas to energy projects are voluntary could have significant error, undertaking a quantitative estimate of the assumption's accuracy is important to the usefulness of the resulting analysis. The accuracy of CAR's assumptions could be determined relatively easily by polling a small sample of landfills to test the assumptions' veracity. A telephone survey of a random sample of landfills would not be overwhelming in either time or resources, and would help determine whether these assumptions are reasonable and/or robust.

Selection Bias

Finally, we note that an examination of existing landfill gas destruction systems as a means to discern the factors which will make future landfill gas destruction systems "viable" has an inherent, strong, selection bias. Specifically, by definition, the landfills with destruction systems in place, found sufficient motivation – regulatory, economic, political, community, environmental, etc – to put them there. The topic of interest, however, is the population of landfills without such systems. The performance standard should question if a carbon revenue stream provides meaningful incentives for these particular landfills to install and destroy methane. A preferable way to address this question would be to examine the population of landfills which have installed new collection capacity (new destruction devices which might qualify for carbon credits) in the past 3-4 years, and ascertain, for that population, what factors appear to be motivating the installation compared to those still without systems.

Conclusion

In the absence of a meaningful attempt to assess the robustness of the underlying data, and without any attempt to verify the appropriateness of CAR's own assumptions, the quantitative use of this data by CAR is dubious. TerraPass has additional compelling anecdotes that undermine the accuracy of the dataset and CAR's assumptions; however, we hope CAR takes our alternative suggestion of a systematic approach to assessing the quality of this same dataset and assumptions.

If CAR staff cannot accomplish, for whatever reason, an analysis that ensures more robust data accuracy, we recommend that no such analysis be undertaken at this time, and that the standard be left alone until a more thorough analysis can be accomplished.

Comments Unrelated to the Performance Standard

3.4.1 (A) – Use of “collection and destruction” language

All projects which qualify under #2 will, by definition, qualify under #1 since #1 notes that gas cannot be “collected and destroyed.” Since in #2 gas is not destroyed, by definition it is not “collected and destroyed.” To simplify, both points could be replaced with a single point which requires that landfill gas has never been destroyed, since whether or not it has been collected is not relevant to the practice threshold. For example:

- 1. Installation of a new qualifying destruction device at an eligible landfill where landfill gas has never been destroyed in any manner prior to the project start date.*

This would also allow language throughout the protocol referring to “collection and destruction” to refer simply to “destruction.”

3.4.1 (A) – Wellfield expansions

The paragraph which begins “Under scenarios...” is confusing. Points #1-3 already each state clearly that a new qualifying destruction device must be installed, so this sentence may be deleted for simplicity. Then, the paragraph addresses wellfield expansions with reference to points #1 and #2. This is confusing since #1 specifically excludes landfills with any kind of collection system (hence any collection wells) and #2 includes only systems with landfill vents, which again are not collection wells.

If this paragraph’s description of “wellfield expansion” is intended to apply to landfills without wellfields which have never destroyed landfill gas (those in situation #1), and landfills with vents which have never destroyed landfill gas (those in situation #2), it would exclude all possible collection and destruction systems at such landfills since they would all be considered expansions; we doubt this is the intended meaning of this language. Also, it creates confusion regarding the ability of a fully qualified landfill (of type #1 or #2), which meets all criteria, to add wells to its qualified collection system at a later time within the crediting period.

To clarify, we suggest reference to points #1 and #2 be deleted in this paragraph, and as a result, the remaining language be embedded within points #3 and #4 since the requirements for each are somewhat different. If there is a nuance here regarding active venting systems (in which the vents are active collection wells), then that rather uncommon situation could be called out as a special case to the general eligibility of landfills without previous destruction activities.

3.4.1 Landfill gas to energy projects

Separate from our comments on the performance standard (above), we note that some landfills use energy for onsite and immediately adjacent uses, such as piping gas to a wastewater treatment plant next door, or using very small quantities of gas for leachate drying, floor heating, and other ancillary applications. The economics of these “hyperlocal” systems are entirely different from, and not really comparable to commercial use of the energy. Often these are done for community benefit or demonstration purposes and do not contribute in any material way to the project’s economics. If any performance standards are adopted which segregate energy projects from other projects, we submit

that hyperlocal projects should be treated as a separate category and considered along with non-energy projects.

Section 3.4.2.2 – State and Local Regulations

The Second paragraph, which begins “For example, on June...” makes reference to the California ARB’s adoption of a landfill methane capture strategy in June 2007. This reference is confusing and should be updated, since the date referenced has not been relevant in the Reserve’s application of the landfill protocol in California. Specifically, the ARB approved a list of early action measure concepts on that date, none of which had been written or vetted as regulations, and some of which never emerged from the subsequent regulatory processes and were dropped from consideration. For this reason, this particular action and date serve as a poor example of a local regulation that would exclude a project for lack of regulatory additionality. It would be more appropriate to reference the date upon which the ARB adopted the regulation, or the date it became law in California, both some years later; or to delete this paragraph altogether as examples are not really necessary to illustrate the point.

Table 6.1 Monitoring Requirements

Requiring a waste-in-place calculation for the beginning of a reporting period imposes a new and supplemental set of calculations to be completed which could require extensive review of base-level records (e.g. scalehouse readings) for the Monitoring Report and for Verification. However, every landfill does submit an annual report to its regulatory agency, which includes waste-in-place data. Requiring a waste-in-place figure to be calculated off-cycle from the regulatory submissions with respect to an arbitrary day for the landfill could be quite burdensome, and relies on an unreasonable level of detail to support a threshold which is arbitrarily chosen and imprecise in its implications.

Instead, any waste-in-place requirement should allow the annual regulatory report to suffice for quantification of waste-in-place for the reporting period that follows the report. For example, if a report is submitted to the regulatory agency on March 31, 2012 that calculates WIP to be 1,000,000 tons as of December 31, 2011; then a reporting period that begins anytime between January 1, 2012 and December 31, 2013 should use the 1,000,000 tons figure.

7.2 Recordkeeping

Since the protocol as written excludes any project selling Renewable Energy Certificates, we are uncertain why the Recordkeeping list includes REC sale contracts. Should there be a reason to confirm REC sales, contracts are not the only way to demonstrate them and the use of publically available records such as REC registries should be both allowed and preferred over contract disclosures when they are available.

7.3 Reporting Period and Verification Cycle

Due to the protocol’s size thresholds, small projects may represent a larger percentage of all landfill projects. As such, the annual verification requirement becomes an expensive burden and an unnecessary risk to the project’s economics. There are two different circumstances were this would be the case:

- a) **If projects are very small (under 15,000 tons annually).** The Reserve’s protocol is more likely to encourage such projects if the verification cycle can be extended to two years in such cases.
- b) **If projects encounter operational challenges that reduce their verifiable reductions in a reporting period below the point of financial break even.** It is not obvious what behavior,



restore the balance

activities, or circumstances the Reserve is trying to prevent or understand by requiring annual verifications without exception, and as such it is difficult to suggest alternatives. However, a requirement to submit contiguous and timely monitoring reports to the Reserve, which can be reviewed in support of the next third-party verification, is one preferable alternative.

Thank you again for the opportunity to comment.

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