**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

MAY 12 2016

Ref: 8P-AR

Ms. Marilyn K. Gillette
Tooele County Clerk
47 S. Main St. Room #318
Tooele, UT 84074

**CERTIFIED MAIL**
**RETURN RECEIPT REQUESTED**

Dear Ms. Gillette:

The U.S. Environmental Protection Agency (EPA) Region 8, will be issuing a public notice in the Tooele Transcript Bulletin and the Salt Lake Tribune on May 17, 2016 regarding the draft Clean Air Act Title V Permit to Operate (40 CFR part 71) for the following source:

Waste Management of Utah, Inc. – Tekoi Landfill

The public comment period for this notice will end on June 16, 2016. Please make the enclosed draft permit, Statement of Basis, and permit application available for public inspection until the end of the public comment period.

Thank you for your assistance in this matter. Should you have any questions regarding our request you may contact me at (303) 312-6043.

Sincerely,

Colin Schwartz, Environmental Scientist
Air Program

Enclosures

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

MAY 12 2016

Ref: 8P-AR

Mr. Bryce Bird
Director Air Quality Division
Utah Department of Environmental Quality
P.O Box 144820
Salt Lake City UT 84114

Re: Notice of Title V Operating Permit Renewal for Operations on the Skull Valley Band of Goshute Indian Community

Dear Mr. Bird:

In accordance with 40 CFR 71.8 and 71.11(d)(2), the U.S. Environmental Protection Agency Region 8 is hereby providing notification to all affected states and tribes of the issuance of the draft title V federal operating permit for the following source located on the Skull Valley Band of Goshute Indians:

Waste Management of Utah, Inc. – Tekoi Landfill

Part 71 Permit Contact – Colin Schwartz, (303)-312-6043

A copy of the draft permit and Statement of Basis may be obtained by contacting the part 71 permit contact. The permit application and other supporting information pertinent to the permit decision are available for review at the following locations:

| | | |
|---|---|---|
| U.S. EPA Region 8<br>Air Program (8P-AR)<br>1595 Wynkoop St.<br>Denver, CO 80202 | Skull Valley Indian Reservation<br>1198 North Main St.<br>Grantsville, UT 84029 | Tooele County Clerk<br>47 S. Main St. Room #318<br>Tooele, UT 84074 |

Electronic copies of the draft permit and Statement of Basis may also be viewed online at: http://www.epa.gov/caa-permitting/caa-permit-public-comment-opportunities-region-8.

In accordance with §71.11(d)(2), EPA Region 8 is providing a 30-day period from May 17, 2016, to June 16, 2016, for public comment on this draft permit. Comments must be received by June 16, 2016, to be considered in the issuance of the final permit. If a public hearing is held regarding this permit, you will be sent a copy of the public hearing notice at least 30 days in advance of the hearing date.

Please submit any written recommendations you may have concerning the terms and conditions of this permit to me at the address listed above.

Sincerely,

Colin Schwartz, Environmental Scientist
Air Program

Enclosure

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

MAY 12 2016

Ref: 8P-AR

Candace Bear, Chairwoman
Skull Valley Band of Goshute Indians
P.O. Box 448
Grantsville, UT 84029

**CERTIFIED MAIL**
**RETURN RECEIPT REQUESTED**

Re: Transmittal of Draft Title V Permit to Operate on the Skull Valley Indian Reservation

Dear Ms. Bear:

In accordance with 40 CFR 71.8 and 71.11(d)(2), the U.S. Environmental Protection Agency (EPA) Region 8 is hereby providing notification to all affected states and tribes of the issuance of the draft Clean Air Act Title V Permit to Operate for the following source located on the Skull Valley Band of Goshute Indians:

Waste Management of Utah, Inc. – Tekoi Landfill

Region 8 is providing a 30-day period, from May 17, 2016 to June 16, 2016 for comment. Please make the enclosed draft permit, Statement of Basis, permit application, and additional supporting information available for public inspection until the end of the public comment period.

Electronic copies of the draft permit and Statement of Basis may also be viewed online at: http://www.epa.gov/caa-permitting/caa-permit-public-comment-opportunities-region-8.

In addition to maintaining the docket in your office, please submit any written recommendations you may have concerning the terms and conditions of the draft permit to me at the following address:

Colin Schwartz
US EPA Region 8
Air Program, 8P-AR
1595 Wynkoop Street
Denver, CO 80202
(303)-312-6520

We have also enclosed copies of a public notice bulletin. Please post this bulletin in locations that you see fit to broadly advertise this public comment period.

Should EPA not accept any or all of these recommendations, you will be notified in writing and will be provided with the reasons for not accepting them. Comments must be received by June 16, 2016, to be considered in the issuance of the final renewal permits for this facility. If a public hearing is held regarding this permit, you will be sent a copy of the public hearing notice at least 30 days in advance of the hearing date.

Sincerely,

Colin Schwartz, Environmental Scientist
Air Program

Enclosures

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

Ref: 8P-AR

MAY 12 2016

Gari Lafferty, Chairwomen
Paiute Indian Tribe of Utah
440 North Paiute Dr.
Cedar City, UT 84720

Re: Notice of Title V Operating Permit Renewal for Operations on the Skull Valley Band of Goshute Indian Community

Dear Ms. Nelson:

In accordance with 40 CFR 71.8 and 71.11(d)(2), the U.S. Environmental Protection Agency Region 8 is hereby providing notification to all affected states and tribes of the issuance of the draft title V federal operating permit for the following source located on the Skull Valley Band of Goshute Indians:

Waste Management of Utah, Inc. – Tekoi Landfill

Part 71 Permit Contact – Colin Schwartz, (303)-312-6043

A copy of the draft permit and Statement of Basis may be obtained by contacting the part 71 permit contact. The permit application and other supporting information pertinent to the permit decision are available for review at the following locations:

| | | |
|---|---|---|
| U.S. EPA Region 8<br>Air Program (8P-AR)<br>1595 Wynkoop St.<br>Denver, CO 80202 | Skull Valley Indian Reservation<br>1198 North Main St.<br>Grantsville, UT 84029 | Tooele County Clerk<br>47 S. Main St. Room #318<br>Tooele, UT 84074 |

Electronic copies of the draft permit and Statement of Basis may also be viewed online at: http://www.epa.gov/caa-permitting/caa-permit-public-comment-opportunities-region-8.

In accordance with §71.11(d)(2), EPA Region 8 is providing a 30-day period from May 17, 2016, to June 16, 2016, for public comment on this draft permit. Comments must be received by June 16, 2016, to be considered in the issuance of the final permit. If a public hearing is held regarding this permit, you will be sent a copy of the public hearing notice at least 30 days in advance of the hearing date.

Please submit any written recommendations you may have concerning the terms and conditions of this permit to me at the address listed above.

Sincerely,

Colin Schwartz, Environmental Scientist
Air Program

Enclosure

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

MAY 12 2016

Ref: 8P-AR

Mr. Bud Rolofson, Air Quality Manager
USDA Forest Service
Rocky Mountain Region
740 Simms Street
Golden, Colorado 80401

Re: Notice of Title V Operating Permit Renewal for Operations on the Skull Valley Band of Goshute Indian Community

Dear Mr. Rolofson:

In accordance with 40 CFR 71.8 and 71.11(d)(2), the U.S. Environmental Protection Agency Region 8 is hereby providing notification to all affected states and tribes of the issuance of the draft title V federal operating permit for the following source located on the Skull Valley Band of Goshute Indians:

Waste Management of Utah, Inc. – Tekoi Landfill

Part 71 Permit Contact – Colin Schwartz, (303)-312-6043

A copy of the draft permit and Statement of Basis may be obtained by contacting the part 71 permit contact. The permit application and other supporting information pertinent to the permit decision are available for review at the following locations:

| | | |
|---|---|---|
| U.S. EPA Region 8<br>Air Program (8P-AR)<br>1595 Wynkoop St.<br>Denver, CO 80202 | Skull Valley Indian Reservation<br>1198 North Main St.<br>Grantsville, UT 84029 | Tooele County Clerk<br>47 S. Main St. Room #318<br>Tooele, UT 84074 |

Electronic copies of the draft permit and Statement of Basis may also be viewed online at: http://www.epa.gov/caa-permitting/caa-permit-public-comment-opportunities-region-8.

In accordance with §71.11(d)(2), EPA Region 8 is providing a 30-day period from May 17, 2016, to June 16, 2016, for public comment on this draft permit. Comments must be received by June 16, 2016, to be considered in the issuance of the final permit. If a public hearing is held regarding this permit, you will be sent a copy of the public hearing notice at least 30 days in advance of the hearing date.

Please submit any written recommendations you may have concerning the terms and conditions of this permit to me at the address listed above.

Sincerely,

Colin Schwartz, Environmental Scientist
Air Program

Enclosure

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

MAY 12 2016

Ref: 8P-AR

Mr. Bruce Pargeets, Acting Director, Energy, Minerals, & Air Director
Ute Indian Tribe
P.O. Box 70, 910 South 7500 East
Fort Duchesne, UT 84026

Re: Notice of Title V Operating Permit Renewal for Operations on the Skull Valley Band of Goshute Indian Community

Dear Mr. Pargeets:

In accordance with 40 CFR 71.8 and 71.11(d)(2), the U.S. Environmental Protection Agency Region 8 is hereby providing notification to all affected states and tribes of the issuance of the draft title V federal operating permit for the following source located on the Skull Valley Band of Goshute Indians:

Waste Management of Utah, Inc. – Tekoi Landfill

Part 71 Permit Contact – Colin Schwartz, (303)-312-6043

A copy of the draft permit and Statement of Basis may be obtained by contacting the part 71 permit contact. The permit application and other supporting information pertinent to the permit decision are available for review at the following locations:

| | | |
|---|---|---|
| U.S. EPA Region 8<br>Air Program (8P-AR)<br>1595 Wynkoop St.<br>Denver, CO 80202 | Skull Valley Indian Reservation<br>1198 North Main St.<br>Grantsville, UT 84029 | Tooele County Clerk<br>47 S. Main St. Room #318<br>Tooele, UT 84074 |

Electronic copies of the draft permit and Statement of Basis may also be viewed online at: http://www.epa.gov/caa-permitting/caa-permit-public-comment-opportunities-region-8.

In accordance with §71.11(d)(2), EPA Region 8 is providing a 30-day period from May 17, 2016, to June 16, 2016, for public comment on this draft permit. Comments must be received by June 16, 2016, to be considered in the issuance of the final permit. If a public hearing is held regarding this permit, you will be sent a copy of the public hearing notice at least 30 days in advance of the hearing date.

Please submit any written recommendations you may have concerning the terms and conditions of this permit to me at the address listed above.

Sincerely,

Colin Schwartz, Environmental Scientist
Air Program

Enclosure

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

MAY 12 2016

Ref: 8P-AR

Mr. Jason Walker, Air Coordinator
Northwestern Band of the Shoshoni Nation
707 North Main St.
Brigham City, UT 84302

Re: Notice of Title V Operating Permit Renewal for Operations on the Skull Valley Band of Goshute Indian Community

Dear Mr. Walker:

In accordance with 40 CFR 71.8 and 71.11(d)(2), the U.S. Environmental Protection Agency Region 8 is hereby providing notification to all affected states and tribes of the issuance of the draft title V federal operating permit for the following source located on the Skull Valley Band of Goshute Indians:

Waste Management of Utah, Inc. – Tekoi Landfill

Part 71 Permit Contact – Colin Schwartz, (303)-312-6043

A copy of the draft permit and Statement of Basis may be obtained by contacting the part 71 permit contact. The permit application and other supporting information pertinent to the permit decision are available for review at the following locations:

| | | |
|---|---|---|
| U.S. EPA Region 8<br>Air Program (8P-AR)<br>1595 Wynkoop St.<br>Denver, CO 80202 | Skull Valley Indian Reservation<br>1198 North Main St.<br>Grantsville, UT 84029 | Tooele County Clerk<br>47 S. Main St. Room #318<br>Tooele, UT 84074 |

Electronic copies of the draft permit and Statement of Basis may also be viewed online at: http://www.epa.gov/caa-permitting/caa-permit-public-comment-opportunities-region-8.

In accordance with §71.11(d)(2), EPA Region 8 is providing a 30-day period from May 17, 2016, to June 16, 2016, for public comment on this draft permit. Comments must be received by June 16, 2016, to be considered in the issuance of the final permit. If a public hearing is held regarding this permit, you will be sent a copy of the public hearing notice at least 30 days in advance of the hearing date.

Please submit any written recommendations you may have concerning the terms and conditions of this permit to me at the address listed above.

Sincerely,

Colin Schwartz, Environmental Scientist
Air Program

Enclosure

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

MAY 12 2016

Ref: 8P-AR

Ms. Carol McCoy, Chief- Air Resources Division
Policy, Planning and Permit Review
National Park Service - AIR
P.O. Box 25287
Denver, Colorado 80225

Re: Notice of Title V Operating Permit Renewal for Operations on the Skull Valley Band of Goshute Indian Community

Dear Mr. Bunyak:

In accordance with 40 CFR 71.8 and 71.11(d)(2), the U.S. Environmental Protection Agency Region 8 is hereby providing notification to all affected states and tribes of the issuance of the draft title V federal operating permit for the following source located on the Skull Valley Band of Goshute Indians:

Waste Management of Utah, Inc. – Tekoi Landfill

Part 71 Permit Contact – Colin Schwartz, (303)-312-6043

A copy of the draft permit and Statement of Basis may be obtained by contacting the part 71 permit contact. The permit application and other supporting information pertinent to the permit decision are available for review at the following locations:

| | | |
|---|---|---|
| U.S. EPA Region 8<br>Air Program (8P-AR)<br>1595 Wynkoop St.<br>Denver, CO 80202 | Skull Valley Indian Reservation<br>1198 North Main St.<br>Grantsville, UT 84029 | Tooele County Clerk<br>47 S. Main St. Room #318<br>Tooele, UT 84074 |

Electronic copies of the draft permit and Statement of Basis may also be viewed online at: http://www.epa.gov/caa-permitting/caa-permit-public-comment-opportunities-region-8.

In accordance with §71.11(d)(2), EPA Region 8 is providing a 30-day period from May 17, 2016, to June 16, 2016, for public comment on this draft permit. Comments must be received by June 16, 2016, to be considered in the issuance of the final permit. If a public hearing is held regarding this permit, you will be sent a copy of the public hearing notice at least 30 days in advance of the hearing date.

Please submit any written recommendations you may have concerning the terms and conditions of this permit to me at the address listed above.

Sincerely,

Colin Schwartz, Environmental Scientist
Air Program

Enclosure

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 8**
**1595 Wynkoop Street**
**Denver, CO 80202-1129**
**Phone 800-227-8917**
**http://www.epa.gov/region08**

MAY 12 2016

Ref: 8P-AR

Mr. Scott Bradley
Area Vice President
Waste Management, Inc.
222 S. Mill Avenue, Suite 333
Tempe, Arizona 85281

**CERTIFIED MAIL**
**RETURN RECEIPT REQUESTED**

Re: Draft Part 71 Operating Permit, Permit #V-SV-000001-2016.00, Waste Management of Utah, Inc., Tekoi Landfill

Dear Mr. Bradley:

The Environmental Protection Agency, Region 8, has completed its review of Waste Management of Utah Inc. (WM's) application for the Tekoi Landfill to obtain a renewed Clean Air Act Title V operating permit pursuant to the Title V Operating Permit Program at 40 CFR part 71(Part 71). The EPA received the application on March 22, 2016.

Enclosed you will find the draft Part 71 operating permit and the corresponding Statement of Basis. The regulations at 40 CFR 71.11(d) require that an applicant, the public and affected states have the opportunity to submit written comments on any draft Part 71 operating permit. All written comments submitted within 30 calendar days after the public notice is published will be considered by the agency in making its final permit decision. Public notice will be published in the Tooele Transcript Bulletin and Salt Lake Tribune on Tuesday, May 17, 2016. The public comment period will end on Thursday, June 16, 2016.

The conditions contained in the permit will become effective and enforceable by the agency if the permit is issued final. If you are unable to accept any term or condition of the draft permit, please submit your written comments, along with the reason(s) for non-acceptance to:

Part 71 Permitting Lead
U.S. EPA, Region 8
Air Program (8P-AR)
1595 Wynkoop Street
Denver, Colorado 80202

If you have any questions concerning the enclosed draft permit or Statement of Basis, please contact Colin Schwartz of my staff at (303) 312-6043.

Sincerely,

for

Monica S. Morales, Acting Director
Air Program

Enclosures

cc: Candace Bear, Skull Valley Band of Goshute Indians Community, Chairwomen
Bruce Clabaugh, Waste Management of Utah, Inc., Environmental Protection Manager
Brad Kloos, Waste Management of Utah, Inc., Senior District Manager



Printed on Recycled Paper

## Schwartz, Colin

**From:** Schwartz, Colin
**Sent:** Thursday, April 21, 2016 3:11 PM
**To:** 'Candace Bear'
**Subject:** RE: Tekoi Landfill

Ms. Bear,

Thank you for taking the time to respond back to me. I truly appreciate your assistance with this.

Regards,

Colin C. Schwartz
Environmental Scientist
Air Permits Division
US EPA Region 8- Denver, CO
303-312-6043

**From:** Candace Bear [mailto:Candaceb@svgoshutes.com]
**Sent:** Wednesday, April 20, 2016 7:24 PM
**To:** Schwartz, Colin <Schwartz.Colin@epa.gov>
**Subject:** RE: Tekoi Landfill

Mr. Schwartz,

We currently do not have an environmental director on staff. The mailing address remains the same for the tribal office.

Thank you,
Candace

*Candace Bear*
*Tribal Chairperson*
*Skull Valley Band of Goshutes*
*Skull Valley Office*
*1198 North Main Street*
*Tooele, UT 84074*

*Office: (435) 882-4532*
*Cell: (435) 830-4526*

**From:** Schwartz, Colin [mailto:Schwartz.Colin@epa.gov]
**Sent:** Thursday, April 14, 2016 12:33 PM
**To:** Candace Bear
**Subject:** Tekoi Landfill

Ms. Candace Bear,

The Environmental Protection Agency has been evaluating an application renewal on the Skull Valley Band Goshute Indian Reservation in Tooele County, Utah. The Tekoi Landfill Application from Waste Management of Utah arrived at our offices approximately 3 weeks ago.

I am making sure that you have received a copy and, if not, I would be happy to send you a pdf copy. I am also available whenever you would like to discuss questions or concerns you may have with the application or permit. I will be writing the permit so please consider me your point of contact, and feel free to call or email me at any time. Before the 30 day public comment period, I will send you the public notice and the date that the notice will be published.

If you could confirm your mailing address and environmental director that we have is correct, I would greatly appreciate that.

Nicole Howell
Skull Valley Band of Goshute Indians
P.O. Box 448
Grantsville, UT
84029

Thank you and have a great week.

Regards,

Colin C. Schwartz
Environmental Scientist
Air Permits Division
US EPA Region 8- Denver, CO
303-312-7040

Disclaimer: This message, along with any attachments, is covered by federal and state law governing electronic communications and may contain confidential and legally privileged information. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, use or copying of this message is strictly prohibited. If you have received this message in error, please reply immediately to the sender and delete this message. Thank you.

## Schwartz, Colin

**From:** Schwartz, Colin
**Sent:** Thursday, April 14, 2016 1:27 PM
**To:** 'O'Connor, Michael'
**Subject:** RE: Tekoi Landfill

Thank you, Michael. These forms looks good so far and I believe this is all we need currently.

However, the Subaru Robin Engine is said to be replaced in your application, and the new, gas powered, Honda Engine takes its place- in the newest forms you sent over, it is suggested that the Honda motor (now listed at 11 hp in the double asterisk **) is off site and the subaru engine is the new water pump?

Should your IE Form_rev 4-10-16 read for IE3: "Honda 13 hp stationary gasoline engine (water pump)?"

Colin C. Schwartz
Environmental Scientist
Air Permits Division
US EPA Region 8- Denver, CO
303-312-7040

**From:** O'Connor, Michael [mailto:MOConnor@scsengineers.com]
**Sent:** Thursday, April 14, 2016 1:12 PM
**To:** Schwartz, Colin <Schwartz.Colin@epa.gov>
**Cc:** Nyiro, Doc <dnyiro@wm.com>
**Subject:** RE: Tekoi Landfill

Colin –

Here is the updated information you requested:

Insignificant Emissions Source Form

Potential to Emit Form (includes only non-fugitive emissions; which in the case of the VOC and HAP emissions reported are actually fugitive emissions, but considered as reasonably controlled emissions, and thus regulated emissions.

Greenhouse Gas PTE Form (Word file) – I have reported here just the regulated GHG emissions. Similarly to the VOC emissions, this is the 75% of the total gas generated, and considered to be reasonably controlled. GHG emissions from the remaining 25% are considered true fugitive emissions and as such, not regulated.

GHG Emission calculations and summary tables – this pdf file has the GHG calculations as well as summary tables that include all categories of GHG emissions; for your information.

Please let me know if you have any questions or require any additional information.

Regards,
Michael

Michael O'Connor
SCS Engineers

Office: 707.546.9461
Mobile: 707.536.6857
moconnor@scsengineers.com

**From:** Schwartz, Colin [mailto:Schwartz.Colin@epa.gov]
**Sent:** Wednesday, April 06, 2016 12:12 PM
**To:** O'Connor, Michael
**Subject:** RE: Tekoi Landfill

Thank you, Michael, this clears it up a bit for me. I'll wait for your final documents to add them to our files.

Please do not hesitate to contact me if you have any further questions.

Colin C. Schwartz
Environmental Scientist
Air Permits Division
US EPA Region 8- Denver, CO
303-312-7040

**From:** O'Connor, Michael [mailto:MOConnor@scsengineers.com]
**Sent:** Wednesday, April 06, 2016 12:18 PM
**To:** Schwartz, Colin <Schwartz.Colin@epa.gov>
**Cc:** Nyiro, Doc <dnyiro@wm.com>
**Subject:** RE: Tekoi Landfill

Mr. Schwartz –

I prepared the following chart to try to sort out the insignificant emission source situation at Tekoi. Please review summary below regarding insignificant emissions, showing what was provided as part of the initial Title V permitting, what was issued in the initial TV permit, and what was provided in this renewal permit:

| | Initial TV application | Initial TV Permit | TV Renewal App |
|---|---|---|---|
| (2016) | Should be | | Notes |
| | *(and subsequent additional information submitted)* | | |
| IE1 engine) app | 55.2-hp Isuzu diesel engine OK | same | 89-hp (correction; same emissions provided in initial app and in renewal app |
| IE2 engine) | 150-hp John Deere diesel engine OK | same | 165-hp (correction; same emissions provided in initial app and in renewal app |
| IE3 engine | 11-hp Subaru-Robin diesel engine 13-hp Honda gasoline engine (replaced 11-hp engine in Jan 2016) | same | 11-hp Subaru-Robin gasoline emissions for both engines provided in renewal app |

IE4 12,000-gal diesel fuel
tank same same OK
emissions provided in initial app and in renewal app

Soil Stockpiles not listed Included in
app emissions provided in initial app
and in renewal app

Leachate system not listed Included in
app emissions provided in initial app
and in renewal app

IE5 500-gal engine oil UST not listed not
included listed on footnote in initial
app and inadvertently in renewal app
(no such tank on-
site)
*(site says no such engine oil tank; maybe had been previously*

confused with mobile diesel fueling tank)

225-gal mobile diesel tank not listed not
included listed on footnote in initial
app and inadvertently in renewal app
Mobile source; not subject to
permitting)
*(site says they have a 500-gal truck-mounted diesel fuel tank; so a mobile source)*

The Insignificant Emissions form included in the application appears to be generally correct with the following correction and assorted comments:

--IE3 – this is a recent replacement engine. The hp and fuel description needs to be corrected. Should it still be considered IE3, with a different description or will it have new ID?

--Soil stockpiles and leachate system – these were presented in the original TV application as insignificant sources, but were not included in the initial TV permit; so not sure what to do with them. I left them off the IE form for this application;

--Engine oil tank – there appears to be no engine oil tank on-site

--The mobile diesel fuel tank is actually 500 gal, but because it is portable, I assumed not subject to permitting

Let me know if any questions or comments about this, then I can make any needed revisions and send you the revised form.

Michael

Michael O'Connor
SCS Engineers
Office: 707.546.9461

Mobile: 707.536.6857
moconnor@scsengineers.com

**From:** Schwartz, Colin [mailto:Schwartz.Colin@epa.gov]
**Sent:** Thursday, March 31, 2016 10:13 AM
**To:** O'Connor, Michael
**Subject:** Tekoi Landfill

Michael,

The insignificant units seemed to have changed from the initial permit in Tekoi Landfill. The renewal application it mentions some of these changes. Could you please clarify the new Insignificant Emission Unit with a description and manufacture information, or preferably enter in the form which I have provided a link for below:
https://www.epa.gov/sites/production/files/2015-11/documents/ie.pdf

Could you please do the same for tanks as you do for engines? Table C-2 notes three tanks on site, a 12,000 gallon (IE4?), 500 (IE5 not listed in the renewal, listed in initial permit however), and a 225 gallon mobile diesel tank.

Thank you,

Colin C. Schwartz
Environmental Scientist
Air Permits Division
US EPA Region 8- Denver, CO
303-312-7040

## Schwartz, Colin

**From:** Schwartz, Colin
**Sent:** Wednesday, April 06, 2016 10:24 AM
**To:** 'O'Connor, Michael'
**Subject:** RE: Tekoi Landfill

Michael,

The clarified form would most certainly be appreciated. We also are hoping for the GHG form to put in with the submission.

The last item I am working on is the PTE table for your statement of basis, I have added the link the old 2010 Statement of Basis where this is found on page 5 (Table 3).

https://www.epa.gov/sites/production/files/documents/WM-TekoiLandfillFinalInitialSOBV-SV-00001-2010.00.pdf

Missing from your recent application table is the 500 gallon tank, IE5, but the tank is mentioned on PDF page 84 of your application in Table C-2. A 225 gallon tank is also mentioned here too. Before I can finish the table discussed above I will need this information.

Finally, I would just like to thank you for getting back to me so quickly. You have been extremely helpful throughout this process.

Regards,

Colin C. Schwartz
Environmental Scientist
Air Permits Division
US EPA Region 8- Denver, CO
303-312-7040

**From:** O'Connor, Michael [mailto:MOConnor@scsengineers.com]
**Sent:** Tuesday, April 05, 2016 5:33 PM
**To:** Schwartz, Colin <Schwartz.Colin@epa.gov>
**Cc:** Nyiro, Doc <dnyiro@wm.com>
**Subject:** RE: Tekoi Landfill

Mr. Schwartz –

Again, I see my oversight has caused confusion. On form EMISS, we included both VOC and NMOC non-fugitive emissions, but on the EPA's PTE form, NMOC is not included. It appears to have inadvertently ended up on the form in the PM10 column. So that should be removed. And you are correct in your email; E1 should have no PM associated with it. Note also that PM was not reported on the PTE form, as all the PM for E2 is fugitive emissions, which are not considered for applicability determinations.

If no additional questions on this form, I will provide a new form with that correction.

Michael

Michael O'Connor
SCS Engineers
Office: 707.546.9461
Mobile: 707.536.6857
moconnor@scsengineers.com

**From:** Schwartz, Colin [mailto:Schwartz.Colin@epa.gov]
**Sent:** Tuesday, April 05, 2016 2:48 PM
**To:** O'Connor, Michael
**Subject:** RE: Tekoi Landfill

Thank you,

I am reviewing the older application and it looks like E2, which is roads and activities, has PM10 associated with it and E1 has no PM. Is this not the case anymore?

Colin C. Schwartz
Environmental Scientist
Air Permits Division
US EPA Region 8- Denver, CO
303-312-7040

**From:** O'Connor, Michael [mailto:MOConnor@scsengineers.com]
**Sent:** Tuesday, April 05, 2016 2:43 PM
**To:** Schwartz, Colin <Schwartz.Colin@epa.gov>
**Subject:** RE: Tekoi Landfill

Mr. Schwartz –

The emission unit values are correct as reported on the PTE (as well as on the EMISS form); however, I did not carry those to the Totals row at the bottom of the PTE form. Here is the revised form.

Please let me know if you have any questions.

I will try to get you that GHG PTE form completed as soon as possible and get that to you.

Regards,
Michael

Michael O'Connor
SCS Engineers
Office: 707.546.9461
Mobile: 707.536.6857
moconnor@scsengineers.com

**From:** Schwartz, Colin [mailto:Schwartz.Colin@epa.gov]
**Sent:** Wednesday, March 30, 2016 10:21 AM
**To:** O'Connor, Michael
**Subject:** RE: Tekoi Landfill

Michael,

I have been looking through the permit and have a question on attached files from you application. Your facility totals on the PTE page do not match, could you please clarify these values?

Also, Noreen has told me you are working on the Annual Emissions Report, would it be possible for you to complete the GHG PTE file that I attached in a word document? I will stress that this document is NOT due on April 1.

Thanks for your help,

Colin C. Schwartz
Environmental Scientist
Air Permits Division
US EPA Region 8- Denver, CO
303-312-7040

**From:** O'Connor, Michael [mailto:MOConnor@scsengineers.com]
**Sent:** Wednesday, March 30, 2016 10:23 AM
**To:** Schwartz, Colin <Schwartz.Colin@epa.gov>
**Subject:** RE: Tekoi Landfill

Great.

Contact me anytime if you have any questions or need any additional information.

Michael

Michael O'Connor
SCS Engineers
Office: 707.546.9461
Mobile: 707.536.6857
moconnor@scsengineers.com

**From:** Schwartz, Colin [mailto:Schwartz.Colin@epa.gov]
**Sent:** Wednesday, March 30, 2016 8:19 AM
**To:** O'Connor, Michael
**Subject:** Tekoi Landfill

Hello Michael,

I would just like to introduce myself as the individual who will be working on the Tekoi Landfill Title V Permit Renewal. I am working through the administrative checklist currently and will let you know if I have any questions as I go through it.

Please do not hesitate to contact me and I look forward to working with you on this.

Regards,

Colin C. Schwartz
Environmental Scientist
Air Program Division
US EPA Region 8- Denver, CO
303-312-7040

R8 Active Municipal Solid Waste (MSW) Landfills (within tribal boundaries)

| Landfill Name | Location | Operator | MSW Cell Size (current cells and closed cells) | MSW received/year | Current Cell Est. Closure Date |
|---|---|---|---|---|---|
| Tekoi Municipal Solid Waste Landfill Facility | Skull Valley Reservation, UT | Waste Management | 90 acres | 265,000 tons/year | ~2024 |
| Buffalo Gap Landfill | Pine Ridge Reservation, SD | Oglala Sioux Tribe | 10 acres | 15,000 tons/year | 2017-18 (20 year cell expansion planned) |
| Rosebud Landfill | Rosebud Indian Reservation, SD | Rosebud Sioux Tribe | 16 acres | 10,500 tons/year | 2021-22 |
| Cheyenne River Sanitary Landfill | Cheyenne River Reservation, SD | Cheyenne River Sioux Tribe | 15 acres | 7,500 tons/year | ~2030 |
| Roberts County Landfill | Lake Traverse Reservation, SD | Roberts County, SD | 30 acres | 12,000 tons/year | 2017 (15-20 year cell expansion planned) |
| City of Wolf Point Landfill | Ft. Peck Indian Reservation, MT | City of Wolf Point, MT | 34 acres | 9,500 tons/year | 2030 |

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 06/30/2015
(Approval extended during OMB review)

# Federal Operating Permit Program (40 CFR Part 71)

## POTENTIAL TO EMIT (PTE)

For each emissions unit at the facility, list the unit ID and the PTE of each air pollutant listed below and sum the values to determine the total PTE for the facility. It may be helpful to complete form **EMISS** before completing this form. Report each pollutant at each unit to the nearest tenth (0.1) of a ton; values may be reported with greater precision (i.e., more decimal places) if desired. Report facility total PTE for each listed pollutant on this form and in section **J** of form **GIS**. The HAP column is for the PTE of all HAPs for each unit. You may use an attachment to show any pollutants that may be present in major amounts that are not already listed on the form (this is not common).

| Emissions Unit ID | Regulated Air Pollutants and Pollutants for which Source is Major (PTE in tons/yr) | | | | | | |
|---|---|---|---|---|---|---|---|
| | NOx | VOC | SO2 | PM10 | CO | Lead | HAP |
| E1 | 0.0 | 94.1 | 0.0 | 0.0 | 0.0 | 0.0 | 4.9 |
| E2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |
| **FACILITY TOTALS:** | | **94.1** | | | | | **4.9** |

Potential-to-Emit Regulated Greenhouse Gas (tons)

| EU# | $CO_2$* | $CH_4$* (as $CO_2e$) | $N_2O$* as $CO_2e$) | C $CO_2e$* |
|---|---|---|---|---|
| 1 | 0.0 | 106,177 | 0.0 | 0.0 |
| 2 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTAL | | 106,177 | | |

$CO_2$ = carbon dioxide; $CH_4$ = methane; $N_2O$ = nitrous oxide;
$CO_2e$ = equivalent $CO_2$.

Note: Greenhouse gas (GHG) emissions cannot trigger major source requirements and the source cannot be considered a major source for GHG unless it is major for another pollutant. At this time Tekoi Landfill is not major for any other regulated pollutants.

## GHG EMISSIONS CALCULATIONS
## TEKOI LANDFILL, TOOELE COUNTY, UTAH

| Year | LFG Collection[3] (scf/year) | Methane Generation (ton/year) | Generated Methane Emitted Through Surface (ton/year) [1, 2] | Methane From Control Device (ton/year) | Nitrous Oxide from Methane Combustion (ton/year) | Generated Carbon Dioxide Emitted Through Surface (ton/year) | Carbon Dioxide from Methane Oxidation in Surface (ton/year) [1,2] | Carbon Dioxide from Methane Combustion (ton/year) |
|---|---|---|---|---|---|---|---|---|
| 2019 [3] | 539,265,600 | 5,615 | 5,053 | NA | NA | 15,440 | 1,544 | NA |
| 2019 | 179,755,200 | 1,872 | 1,684 | NA | NA | 5,147 | 515 | NA |

Notes:

[1] 75% collection efficiency assumed.

[2] 10% oxidation of methane in landfill surface based on EPA GHG Reporting Rule

[3] For 2019, the last year prior to operation of a gas collection and control system, 75% of genrated LFG is considered to be reasonably collectible; and therefore controlled emissions

| | |
|---|---|
| 75.0% | Collection Efficiency |
| 506 | BTU/scf LFG |
| 104.06 | kg CO2/MMBTU methane |
| 907 | kg/ton |
| 0.0032 | kg methane/MMBTU |
| 0.00063 | kg N2O/MMBTU |
| 35.31 | scf/m3 |
| 23.69 | L/mol |
| 44.01 | g/mol |
| 525600 | min/yr |
| 0.9074 | MG/ton |

| | | |
|---|---|---|
| 2019 | **6,793** | 2019 MG/yr methane production |
| 2019 | **1,026** | scfm (2019 LFG collection rate; based on LandGEM) |
| 2019 | **1,368** | scfm (2019 LFG generation rate from LandGEM) |

## SUMMARY OF GHG EMISSIONS
## TEKOI LANDFILL, TOOELE COUNTY, UTAH

**2019**

| Source | (tons/yr) | (tons $CO_2e$/yr) | Biogenic? | Fugitive? |
|---|---|---|---|---|
| Fugitive Methane Emissions | 1,684 | 35,372 | No | Yes |
| Fugitive Carbon Dioxide Emissions | 5,661 | 118,891 | Yes | Yes |
| Fugitive Emissions Total | | 154,263 | | |
| | | | | |
| Controlled Methane Emissions | 5,053 | 106,117 | No | No |
| Controlled Carbon Dioxide Emissions | 16,984 | 16,984 | Yes | No |
| Controlled Emissions Total | | 123,102 | | |
| | | | | |
| Stack Carbon Dioxide | NA | NA | Yes | No |
| Methane from Combustion | NA | NA | No | No |
| Nitrous Oxide from Combustion | NA | NA | No | No |
| Combustion Emissions Total | | 0 | | |
| | | | | |
| **Total GHG Emissions** | | **277,365** | | |

## GHG EMISSION FACTORS
## TEKOI LANDFILL, TOOELE COUNTY, UTAH

| Fuel | Emission Factors[1] (kg/MMBtu) Carbon Dioxide | Methane | Nitrous Oxide |
|---|---|---|---|
| LFG | 104.06 | 3.20E-03 | 6.30E-04 |

Notes:

[1] Emission factors obtained from 40 CFR Part 98 Tables C-1 and C-2, except carbon dioxide emisson factor for LFG. which was obtained from Title 17 Code of California Regulations (CCR) Subchapter 10, Appendix A to include emissions passing through the control device uncombusted.

### GHG TYPES

| Anthropogenic | Biogenic | Fugitive | Unregulated | Regulated |
|---|---|---|---|---|
| Landfill surface<br>$CH_4$ | Landfill surface<br>$CO_2$ | Landfill surface<br>$CO_2$<br>$CH_4$ | Flare<br>$CO_2$ | Flare<br>$CH_4$<br>$N_2O$ |
| Flare<br>$CH_4$<br>$N_2O$ | Flare<br>$CO_2$ | | Fugitive LF surface<br>$CO_2$<br>$CH_4$ | Controlled LF surface<br>$CH_4$ |

### 2019
### GHG EMISSIONS BY SOURCE

| Source | (tons $CO_2e$/yr) |
|---|---|
| Fugitive LF surface | 154,263 |
| Controlled LF surface | 123,102 |
| Flare | NA |
| **Total** | **277,365** |

### BIOGENIC GHG EMISSIONS

| Source | (tons $CO_2e$/yr) |
|---|---|
| LF Surface | 135,875 |
| Flare | NA |
| **Total** | **135,875** |

### ANTHROPOGENIC GHG EMISSIONS

| Source | (tons $CO_2e$/yr) |
|---|---|
| LF Surface | 141,490 |
| Flare | NA |
| **Total** | **141,490** |

### REGULATED GHG EMISSIONS

| Source | (tons $CO_2e$/yr) |
|---|---|
| Flare | NA |
| Controlled LFG | 106,117 |
| **Total** | **106,117** |

## Schwartz, Colin

**From:** O'Connor, Michael <MOConnor@scsengineers.com>
**Sent:** Wednesday, April 06, 2016 12:18 PM
**To:** Schwartz, Colin
**Cc:** Nyiro, Doc
**Subject:** RE: Tekoi Landfill

Mr. Schwartz –

I prepared the following chart to try to sort out the insignificant emission source situation at Tekoi. Please review summary below regarding insignificant emissions, showing what was provided as part of the initial Title V permitting, what was issued in the initial TV permit, and what was provided in this renewal permit:

| | Initial TV application | Initial TV Permit | TV Renewal App | |
|---|---|---|---|---|
| (2016) | | Should be | | Notes |
| | *(and subsequent additional information submitted)* | | | |
| IE1 engine) | 55.2-hp Isuzu diesel engine | same | 89-hp (correction; same | OK emissions provided in initial app and in renewal app |
| IE2 engine) | 150-hp John Deere diesel engine | same | 165-hp (correction; same | OK emissions provided in initial app and in renewal app |
| IE3 engine | 11-hp Subaru-Robin diesel engine | same | 11-hp Subaru-Robin gasoline | 13-hp Honda gasoline engine emissions for both engines provided in renewal app (replaced 11-hp engine in Jan 2016) |
| IE4 tank | 12,000-gal diesel fuel | same | same | OK emissions provided in initial app and in renewal app |
| | Soil Stockpiles | not listed | Included in app | emissions provided in initial app and in renewal app |
| | Leachate system | not listed | Included in app | emissions provided in initial app and in renewal app |
| IE5 | 500-gal engine oil UST (no such tank on-site) | not listed | not included | listed on footnote in initial app and <u>inadvertently</u> in renewal app *(site says no such engine oil tank; maybe had been previously confused with mobile diesel fueling tank)* |

225-gal mobile diesel tank not listed not included listed on footnote in initial app and inadvertently in renewal app Mobile source; not subject to permitting)

*(site says they have a 500-gal truck-mounted diesel fuel tank; so a mobile source)*

The Insignificant Emissions form included in the application appears to be generally correct with the following correction and assorted comments:

--IE3 – this is a recent replacement engine. The hp and fuel description needs to be corrected. Should it still be considered IE3, with a different description or will it have new ID?

--Soil stockpiles and leachate system – these were presented in the original TV application as insignificant sources, but were not included in the initial TV permit; so not sure what to do with them. I left them off the IE form for this application;

--Engine oil tank – there appears to be no engine oil tank on-site

--The mobile diesel fuel tank is actually 500 gal, but because it is portable, I assumed not subject to permitting

Let me know if any questions or comments about this, then I can make any needed revisions and send you the revised form.

Michael

Michael O'Connor
SCS Engineers
Office: 707.546.9461
Mobile: 707.536.6857
moconnor@scsengineers.com

---

**From:** Schwartz, Colin [mailto:Schwartz.Colin@epa.gov]
**Sent:** Thursday, March 31, 2016 10:13 AM
**To:** O'Connor, Michael
**Subject:** Tekoi Landfill

Michael,

The insignificant units seemed to have changed from the initial permit in Tekoi Landfill. The renewal application it mentions some of these changes. Could you please clarify the new Insignificant Emission Unit with a description and manufacture information, or preferably enter in the form which I have provided a link for below:
https://www.epa.gov/sites/production/files/2015-11/documents/ie.pdf

Could you please do the same for tanks as you do for engines? Table C-2 notes three tanks on site, a 12,000 gallon (IE4?), 500 (IE5 not listed in the renewal, listed in initial permit however), and a 225 gallon mobile diesel tank.

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 06/30/2015
(Approval extended during OMB review)

Federal Operating Permit Program (40 CFR Part 71)

**INSIGNIFICANT EMISSIONS (IE)**

On this page list each insignificant activity or emission unit. In the "number" column, indicate the number of units in this category. Descriptions should be brief but unique. Indicate which emissions criterion of part 71 is the basis for the exemption.

| Number | Description of Activities or Emissions Units | RAP (except HAP) | HAP |
|---|---|---|---|
| IE1* | Isuzu 89-hp stationary diesel engine (fuel pump) | VOC | HAP |
| IE2* | John Deere 165-hp stationary diesel engine (generator) | VOC | HAP |
| IE3** | Subaru-Robin 13-hp stationary gasoline engine (water pump) | VOC | HAP |
| IE4* | 12,000 gallon diesel fuel tank | VOC | HAP |
| | Soil Stockpiles | PM | |
| | Leachate collection system | VOC | HAP |
| | | | |
| | | | |
| | | | |
| | | | |

* Currently listed as insignificant emission units in Title V Permit.

** Replaced 11-hp diesel-fired engine listed in Permit as IE3 in January 2016.

See Appendix C for emission calculations for all sources listed.

SCS ENGINEERS

# Title V Operating Permit Renewal Application Tekoi Landfill Tooele County, Utah (Operating Permit V-SV-0001-09.00)

Presented to:

Waste Management of Utah, Inc.

8652 South 4000 West
West Jordan, UT 84088
(801) 282-8201

Presented by:

**SCS ENGINEERS**
3117 Fite Circle, Suite 108
Sacramento, CA 95827
(916) 361-1297

March 2016
File No. 01207310.00, Task 35
**Offices Nationwide**
**www.scsengineers.com**

# Title V Operating Permit

# Renewal Application

## Tekoi Landfill
## Tooele County, Utah
## (Operating Permit V-SV-0001-09.00)

Presented To:

**Waste Management of Utah, Inc.**
8652 South 4000 West
West Jordan, UT 84088
(801) 282-8201

Presented By:

**SCS ENGINEERS**
3117 Fite Circle, Suite 108
Sacramento, CA 95827
(916) 361-1297

March 2016
File No. 01207310.00, Task 35

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Figure 1 Site Map

## Appendices

A Current Part 71 Operating Permit
B Part 71 Application Forms
C Emission Calculations for Insignificant Sources
D WIAC Report
E LandGEM Landfill Gas Generation Model Results (AP-42 and NSPS)
F Five-Year NMOC Emissions Rate Report (January 2014) (excerpt)
G Annual Compliance Certification (March 2015)
H Six-Month Monitoring Report (September 2015)
I 2014 Annual Fee Emission Calculations (March 2015)
J GHG Fee Adjustment Payment Letter (March 2016)

# 1 INTRODUCTION / SOURCE DESCRIPTION

The Tekoi Landfill (TLF), which owned by the Skull Valley Band Goshute Indian Community (SVBGIC) and operated by CR Group, LLC (CR), serves as a regional municipal solid waste (MSW) and construction and demolition (C&D) debris disposal facility.

The Initial Title V Permit (Permit) for the TLF was issued by the United States Environmental Protection Agency (USEPA) and became effective on September 22, 2011. The 5-year permit term expires on September 22, 2016. This application has been prepared by SCS Engineers (SCS) on behalf of Waste Management of Utah, Inc (WM) for renewal of the Permit. A copy of the Permit is provided as **Appendix A**.

No hazardous wastes or infectious wastes are accepted for disposal, nor is the incineration of waste permitted. TLF currently accepts approximately 750 tons of waste per day (tpd); however, it is permitted to accept a maximum of 4,000 tpd.

The landfill is comprised of a 6-Phase MSW disposal area and a North and South C&D debris disposal area. The MSW portion of the landfill previously operated as a balefill landfill, but has not done so for several years and does not expect to resume such operation in the future. Therefore, it is requested that any reference to such operation be removed from the Title V Permit.

Wastes that are accepted for disposal at TLF include:

- MSW
- C&D debris

A site map of the TLF is provided as **Figure 1**.

## 1.1 LOCATION

TLF is located on a portion of Section 18, Township 5 South, Range 8 West, in the SVBGIC, in Tooele County, Utah.

## 1.2 OPERATING SCHEDULE

TLF's typical operating hours are 5 days a week (Monday through Friday) for approximately 9 hours per day. The site is generally closed on Saturdays and Sundays. However, TLF may operate on Saturdays on a non-routine basis, as necessary. There are no restrictions on operational days or on operational hours per day in the current Title V Permit. Site hours may extend beyond the typical operating hours to allow for site preparation and daily cover application, as well as for seasonal variation in waste acceptance or as needed to service the facility's customers.

# 2 SITE CHARACTERISTICS

## 2.1 DESIGN

Construction of the TLF began in December 2004, and was designed using cut and fill methods. As stated above, the landfill is comprised of a 6-Phase MSW disposal area and a North and South C&D debris disposal area. The disposal areas were formed primarily by excavating to a designed floor elevation and gradient, and by raised embankments around the perimeter of the refuse areas. Phase division berms are provided at a spacing of 780 to 790 feet extending from the north embankment to the south embankment through the fill area. These berms separate the cell into 6 individual phases and leachate management areas designated as Phase 1 through Phase 6 (Phase 1 being the northernmost area and Phases 5 and 6 the southernmost areas). The leachate sumps and floor areas of each phase are designed with similar sump and floor configurations. Approximate lined operational MSW fill areas are provided below in **Table 1**.

**Table 1. MSW Operational Areas**

| Phase | Operational Area (acres) |
|---|---|
| 1 | 72.5 |
| 2 | 72.5 |
| 3 | 71.8 |
| 4 | 71.8 |
| 5 | 29.7 |
| 6 | 35.0 |
| **Total** | **353.2** |

The total footprint for the MSW and C&D disposal area is approximately 428.3 acres.

## 2.2 LINING SYSTEM

Each phase has a state-of-the-art base, composite liner containment system consisting of either a low permeability compacted soil liner (Compacted Clay Liner, CCL) or Geosynthetic Clay Liner (GCL) and an overlying geomembrane. The CCL includes 2 feet of compacted soil consisting of natural onsite soils amended with imported materials as needed, such as bentonite clay, to achieve a maximum permeability of $1x10^{-7}$ cm/sec as required by 40 Code of Federal Regulations (CFR) Part 258. The geomembrane consists of a 60-millimeter high-density polyethylene (HDPE) geomembrane liner. The composite liner system covers the floor area, side slopes, and the berms.

## 2.3 LEACHATE COLLECTION SYSTEM

The leachate collection system consists of a geonet drainage layer placed directly over the HDPE geomembrane liner system. In addition, 6-inch diameter perforated leachate conveyance pipes are positioned on the south side of each landfill phase. Also, 4-inch diameter perforated conveyance pipes extend north along the west side of the floor for each phase. The 4-inch diameter and 6-inch diameter leachate conveyance pipes provide an outlet from the geonet drainage layer so hydraulic head build-up does not exceed the 1 foot of depth allowed by 40 CFR Part 258. Drainage rock is also placed around the leachate conveyance pipes as structural fill to support the overlying load imposed by the waste pile.

The leachate conveyance pipes consist of perforated corrugated HDPE pipe and are designed to receive leachate from the leachate collection system and subsequently convey the leachate to the low point of each Phase.

Additionally, a series of 8-inch HDPE pipes withdraw the leachate from the low points of each phase, directing the flow to a leachate collection pond located near the south west corner of the MSW area, where the leachate is evaporated.

## 2.4 GAS COLLECTION AND CONTROL SYSTEM

TLF does not currently have a landfill gas (LFG) collection and control system (GCCS). Under the New Source Performance Standards (NSPS) for MSW Landfills (40 CFR, Part 60, Subpart WWW), landfill owners/operators are required to install a GCCS when the landfill design capacity is greater than 2.5 million megagrams (Mg) by mass and 2.5 million cubic meters by volume and the non-methane organic compound (NMOC) emission rate is greater than 50 Mg per year. TLF has a design capacity of approximately 45 million cubic meters by volume for MSW disposal. As required by NSPS regulations, an initial design capacity report was submitted to the USEPA Region 8 on March 31, 2008; and an NMOC emission rate for the landfill was calculated using the procedures specified in § 60.754. The calculated annual NMOC emission rate was determined using the EPA's Landfill Gas Emissions Model (*LandGEM [Version 3.02]*). The annual rate was projected to exceed 50 Mg/year, triggering the additional requirements specified in 40 CFR § 60.752(b)(2) as of March 10, 2008, the date the annual rate report was submitted.

Tier 2 field sampling activities, as allowed under NSPS regulations, were initially conducted in June 2008. The report concluded the estimated annual NMOC emission rate would exceed 50 Mg per year (Mg/yr) in 2009. Subsequent Tier 2 testing has been conducted at the site, most recently in 2013. The results were submitted to the EPA in a January 2014 report. The Tier 2 NMOC concentration of 965 parts per million by volume (ppmv) as hexane was used to calculate annual NMOC emission rates, which were determined to be less than 50 Mg/yr for the 5-year period from 2013 through 2017. This Tier 2 NMOC concentration value is used in this application for emission calculations. Per NSPS regulations, this Tier 2 concentration is valid for up to 5 years. As such, additional Tier 2 testing will be required in 2018. An excerpt of the January 2014 NMOC Report is provided as **Appendix F**.

When the calculated NMOC emission rate is equal to or greater than 50 Mg/yr, TLF will be required to submit a GCCS design plan signed by a professional engineer within one year and install a GCCS that captures the gas generated within the landfill within 30 months after the first annual report in which the emission rate equals or exceeds 50 Mg/yr. TLF will comply with these requirements when NMOC emissions exceed 50 Mg/yr using Tier 2 methods. Fugitive potential to emit (PTE) emissions related to LFG will decrease considerably after the GCCS is installed.

# 3 EMISSION RELATED INFORMATION

Emissions from significant sources are summarized on the Forms EMISS and PTE (see **Appendix B**) as required by the Part 71 Permit Application Package developed by the USEPA. Supporting emission calculations for each significant source are provided in attached **Tables 2 through 6**. Emission calculations documenting estimated emissions from insignificant sources are provided in **Appendix C**.

## 3.1 FUGITIVE EMISSION SOURCES

The following fugitive emission sources are associated with the TLF operations:

- LFG emissions containing NMOCs, volatile organic compounds (VOCs), and hazardous air pollutants (HAPs) are generated by the microbial degradation of MSW.

- Paved and unpaved roadways used by refuse hauling vehicles and other on-site vehicles generate fugitive particulate matter (PM) dust emissions, including particulate matter less than 10 microns (PM-10), PM-2.5, and total suspended particulate (TSP).

- PM dust emissions are generated from transportation, stockpiling, and disposition of soil cover material on the landfill surface.

- Stockpile erosion occurs due to the affects of wind on cover stockpiles and landfill surfaces with daily, intermediate, and/or final cover material. The resulting PM dust emissions have been determined as insignificant for Title V permitting purposes pursuant to Part 71 §71.5(c)(11 (ii)(A) and (B); calculated PTE of PM-10 emissions were 0.08 tons per year. Emission calculations for insignificant sources are provided in **Appendix C**.

- Leachate collection, storage and recirculation generates very low levels of VOCs and HAPs. The leachate is generated by precipitation or other moisture which percolates through the refuse mass and is collected by the subsurface leachate recovery system. The leachate is collected from the drainage layer and pumped through the series of 8-inch HDPE conveyance pipes to the leachate evaporation pond. Emissions from this source are considered to be insignificant for Title V permitting purposes pursuant to Part 71 §71.5(c)(11)(ii)(A) and (B); PTE HAP emissions were 9.2 pounds per year (lb/yr) (**Appendix C**).

## 3.2 NON-FUGITIVE EMISSION SOURCES

The following non-fugitive emission sources are associated with the TLF operations:

- Internal combustion engine (ICE) emissions generate nitrogen oxides (NOx), carbon monoxide (CO), sulfur oxides (SOx), VOC, HAPs, and PM emissions. TLF currently uses three stationary IC engines: one 89-horsepower (hp) diesel-powered generator engine, one 165-hp diesel-powered generator engine, and one 13-hp gasoline-powered water pump engine. Emissions from all three engines are considered insignificant for Title V purposes, as their PTE criteria air pollutant (CAP) and HAP emission levels are below the significance thresholds pursuant to Part 71 §71.5(c)(11)(ii)(A) and (B) (**Appendix C**).

  Changes from current Title V Permit: The 11-hp water pump engine currently listed on the Title V Permit as IE3 was replaced in January 2016 by the model year 2014 13-hp gasoline-powered engine noted above. The old engine was subject to the NSPS regulations applicable to compression-ignition (CI or diesel-powered) engines (NSPS Part 60, Subpart IIII), This new engine is subject to the NSPS regulations for spark-ignition (SI) engines (Subpart JJJJ); which require that the engine be certified and that it be operated and maintained in accordance with manufacturer's instructions.

- TLF has a diesel fuel storage tank on site. This emission unit is considered insignificant for Title V purposes based on vapor pressure of diesel (0.4 psi) and insignificant VOC and HAP emission levels pursuant to Part 71 §71.5(c)(11)(ii)(A) and (B) (**Appendix C**).

# 4 METHODOLOGY FOR EMISSION CALCULATIONS

Assumptions, methodologies, and conversions for the emission calculations for the revised Title V permit application are discussed in the following section and the attached emissions calculation tables (**Tables 2 through 6**). Actual emissions (for 2015) and potential emissions are calculated and provided in this application.

## 4.1 LANDFILL AND RELATED EMISSIONS

### 4.1.1 LFG Emissions

The LFG estimates were based on the landfill design capacity, refuse disposal rates, and estimated future refuse disposal rates. The current disposal rate (for 2015) is 191,967 tpy. Future disposal rates presented in this application are the maximum potential fill rate based on 4,000 tpd and operating 6 days per week; for a fill rate of 1,248,000 tons per year). Based upon a design capacity of 45 million cubic yards (estimated to accommodate 47,939,986 tons of MSW, the current amount of waste in place, and this maximum fill rate, the year of closure would be 2052 (excluding post closure activities).

LFG generation estimates, in standard cubic feet per minute (scfm), are developed using USEPA's Landfill Gas Emissions Model (*LandGEM, Version 3.02)*, using two scenarios, (1)

region-specific k = 0.02 and $L_o$ = 100 $m^3$/Mg parameters which are recommended in the EPA's "Compilation of Air Pollutant Emission Factors" (AP-42) document for dry climates, and reported historical and estimated future disposal rates and (2) the NSPS k = 0.02 and $L_o$ = 170 $m^3$/Mg parameters to assess when a GCCS will be required under the NSPS.

NSPS inputs to the LandGEM are used for NSPS applicability, and the NSPS scenario noted above was developed to determine when a GCCS would be required at TLF. The NSPS is a federally enforceable requirement that limits PTE for regulated landfills by requiring a landfill to install a GCCS within 30 months of the first annual NMOC report in which the NMOC emission rate equals or exceeds 50 Mg/yr. Once the GCCS is installed, fugitive PTE emissions will drop considerably.

The year in which NMOC emissions will likely first exceed 50 Mg/year will be 2017. A GCCS will be required to go online within 30 months of this date or by 2020. Under this scenario, 2019 is expected to be the last year when LFG emissions would be completely uncontrolled under the NSPS scenario. Beginning earliest in 2020, the NSPS-required GCCS would reduce NMOC emissions by 65% to 85%, as specified in the NSPS (default value is 75%).

PTE emissions for the controlled landfill were estimated using the AP-42 version of the LandGEM model run in accordance with USEPA guidance and the NSPS rule, which indicates that AP-42 defaults were to be used for all Clean Air Act purposes besides the NSPS (i.e. Title V). In addition, default HAP concentrations in LFG from the Waste Industry Air Coalition (WIAC) report titled, *Comparison of Recent Landfill Gas Analysis with Historic AP-42 Values* (**Appendix D**) were used in the analysis. The AP-42 model scenario is run twice for this application. One run uses the most recent Tier 2 NMOC concentration (965 ppmv) to determine current emissions; and the other run uses the NSPS default concentration (4,000 ppmv) as a worst-case scenario to determine NMOC PTE. The year of maximum LFG generation is 2052; while the year of maximum non-fugitive (controlled) NMOC emissions is expected to occur in 2019, the year before a GCCS is expected to be installed. Non-fugitive emissions are Regulated Emissions; used for determining major source and prevention of significant deterioration (PSD) status under the Clean Air Act (CAA). As such, PTE for regulated emissions and for unregulated (fugitive) emissions are presented separately in the attached Significant Source Emissions Summary table (**Table 2**).

Results of both runs of the LandGEM model using AP-42 defaults as well as the LandGEM NSPS model run are provided in **Appendix E**.

## 4.2 FUGITIVE DUST EMISSIONS FROM VEHICLE TRAFFIC AND LANDFILL COVER ACTIVITIES

### 4.2.1 Vehicle Traffic on Paved Roads

PM-10, PM-2.5, and TSP emissions from vehicles are estimated by multiplying a vehicle emissions factor (in lbs/vehicle-mile) by total vehicle mileage. The vehicle emissions factors are determined using the following equation as referenced in AP-42, P. 13.2.1-3, Equation (2):

$$E = [k(sL/2)^{0.91} (W)^{1.02}] (1-P/4N)$$

where:

E = Emission factor (lb/vehicle-mile traveled (VMT))

k = Particle size multiplier for PM-10 particle size (dimensionless) = 0.022 lbs/VMT, 0.0024 lbs/VMT for PM-2.5, 0.082 lbs/VMT for TSP (from AP-42, Table 13.2-1.1)

sL = Road surface silt loading factor (grams per cubic meter [g/m2]) = 7.4 g/m2 (from AP-42, Table 13.2.1-4), default for landfill roads.

W = Mean vehicle weight (tons) = 24.50 tons

P = Number of days with >0.01 inches of rainfall = 90 days (from AP-42, Figure 13.2.1-2)

N = Number of days in averaging period for P estimate = 365 days (from AP-42, Section 13.2.1-7)

Actual (2015) emissions are scaled up to estimate PTE emissions by using the ratio of the permitted waste acceptance rate (1,248,000 tpy) to the actual waste acceptance for 2015 of 191,967 tons, for a scaling ratio of 6.50.

### 4.2.2 Vehicle Traffic on Unpaved Roads and Landfill Surfaces

PM-10, PM-2.5 and TSP emissions from vehicles are estimated by multiplying a vehicle emissions factor (in lbs/vehicle-mile) by total vehicle mileage. The vehicle emissions factors are determined using the following equation as referenced in AP-42, P. 13.2.2-4, Equation (1a):

$$E_{ext} = [(k) (s/12)^a (W/3)^b (365-p/365)]$$

Where:

$E_{ext}$ = Annual size-specific emission factor extrapolated for natural mitigation (lb/VMT)

k = Empirical constant = 1.5 lb/VMT for PM-10, 0.15 lb/VMT for PM-2.5, and 4.9 lb/VMT for TSP (AP-42, Table 13.2.1.3)

s = Silt content of road surface material (%) (6.4% for unpaved roads per AP-42, Table 13.2.2-1), default for municipal solid waste landfills.

a = Empirical constant = 0.9 (unitless) for PM-10, 0.9 for PM-2.5, and 0.7 for TSP (AP-42, Table 13.2.2-2)

W = Mean vehicle weight = 18.40 tons

b = Empirical constant = 0.45 (unitless) for PM-10, PM-2.5, and TSP (AP-42, Table 13.2.2-2)

p = Number of days with at least 0.01 in. of precipitation/year = 90 days (estimated using AP-42, Figure 13.2.1-2)

Differences between actual (2015) and PTE emissions are based in part on differences in the total miles traveled under each scenario (**Table 4**); as well as on the calculated ratio of the permitted waste acceptance rate (1,248,000 tpy) to the actual waste acceptance for 2015 of 191,967 tons in order to scale up for maximum conditions; for a scaling ratio of 6.50.

### 4.2.3 Unloading Cover Material

Actual and PTE fugitive dust emissions from unloading cover material into storage piles and onto the landfill are calculated using an emissions factor (in lbs/ton transferred) multiplied by the amount of material transferred per year. The emissions factor is estimated using the following equation (from AP 42, p. 13.2.4.3).

$$E = k\,(0.0032)\,(G/5)^{1.3} / (H/2)^{1.4}$$

E = Emission factor (lb/ton)

k = Particle size multiplier = 0.35 for PM-10, 0.053 for PM-2.5, and 0.74 for TSP (from AP-42, p. 13.2.4.3)

G = Mean wind speed = 5.0 miles per hour (mph) (from Salt Lake City International Airport)

H = Material moisture content (from AP-42, Table 13.2.4-1) = 12 % (mean value for MSW landfill cover material)

Emissions under the PTE scenario are calculated by multiplying actual emissions by the ratio of the permitted waste acceptance rate (1,248,000 tons/year) to the actual waste acceptance for 2015 of 191,967 tons in order to scale up for maximum conditions; for a scaling ratio of 6.50.

### 4.2.4 Wind Erosion of Cover Storage Piles [Insignificant]

Fugitive dust emissions from wind erosion of the cover storage piles are estimated multiplying emission factors (in lbs/acre) by the area of the storage piles. Emissions factors for windblown dust have been published in the EPA's FIRE (Factor Information and Retrieval System) database, with separate emission factors for actual active and inactive days. The calculated PM-10 emissions, as shown in **Appendix C** are 0.5 tpy, less than the significant source threshold of 2 tpy. As such this emission source is considered insignificant for Title V permitting purposes.

Emissions under the PTE scenario are calculated by multiplying actual emissions by the ratio of the permitted waste acceptance rate (1,248,000 tons/year) to the actual waste acceptance for 2015 of 191,967 tpy) in order to scale up for maximum conditions; for a scaling ratio of 6.50.

## 4.3 EMISSIONS FROM INTERNAL COMBUSTION ENGINES [INSIGNICANT]

Stationary ICEs used on site consist of one 89-hp diesel-powered generator engine, one 165-hp diesel-powered generator engine, and one 13-hp gasoline-powered water pump engine. These are

denoted on the current Title V Permit as insignificant Emission Units IE1, IE2, and IE3, respectively. Both current (2015) and PTE emissions were calculated. The PTE hours of operation are estimated based upon the ratio of PTE-to-actual refuse tonnages multiplied by the current hours of operation; emissions of CAP and HAP emissions for each engine were calculated using the emissions factors contained in AP-42, 3.3.

The calculated emissions, as shown in **Appendix C**, are all less than the significant source thresholds of 2 tpy and 1,000 pounds per year (lbs/yr) for CAPs and HAPs, respectively. As such, all of these stationary engines are considered insignificant sources for Title V permitting purposes.

## 4.4 OTHER INTERNAL COMBUSTION ENGINES [NOT SUBJECT TO PERMITTING]

Several other ICEs used at the site are portable (non-road engines) and as such not subject to permitting, per the definition of 'non-road' in 40 CFR 89 and the definition of 'stationary source' in Title III, Section 302 of the CAA which states that a non-road emission source is not regulated under the CAA. These engines are listed below and are intended as an update of the non-road engine list found in Section I (d) of the Statement of Basis document for the current Title V Permit.

**Tekoi Landfill**
**Non-Road Engines**

| Make/Model | Rated Output (hp) | Use | Fuel | 2015 Hours |
|---|---|---|---|---|
| Briggs-Vanguard 305447 | 16 | Alladin Pressure washer | Gasoline | 5 |
| Kohler CS125TG | 12.5 | Blue Star welder | Gasoline | 10 |
| Cat C1.1 | 28.2 | Tarpomatic | Diesel | 25 |
| John Deere 4045DF150B | 84 | Sullair Compressor | Diesel | 65 |
| Perkins 103-10 | 23.5 | Towable light plant | Diesel | 1040 |
| Cat C1.1 | 28.2 | Towable light plant | Diesel | 1040 |
| Lister | 14.6 | Allmand light plant | Diesel | 10 |
| Predator 212cc | 6.5 | Generator | Gasoline | 1040 |
| Predator 212cc | 6.5 | Generator | Gasoline | 1040 |
| Honda GX270 | 8.5 | Compressor | gas | 10 |
| Cat 3054 | 130 | Tipper | Diesel | 1300 |
| Cat C4.4 | 142 | Pony motor (tipper) | Diesel | 10 |

## 4.5 EMISSIONS FROM LEACHATE MANAGEMENT ACTIVITIES [INSIGNICANT]

Emissions from leachate management activities are estimated using the assumption that during collection and management of the leachate, all VOCs and HAPs in the leachate will be emitted.

Current leachate generation is estimated at approximately, 33.8 gallons per week, based upon leachate sampling event in November 2006. The maximum potential volume of leachate generated, 12,884,500 gallons per year, was estimated by using the total landfill footprint (acres) and annual rainfall.

PTE VOC and HAP emissions are estimated by multiplying the concentration by the total amount of leachate generated and converting to tons or pounds (**Appendix C**). Emissions from this source are considered to be insignificant for Title V permitting purposes pursuant to Part 71 §71.5 (11)(ii)(A) and (B) because calculated PTE VOC and HAP emissions were below the respective thresholds of 2 tpy and 1,000 lbs/yr.

Calculated VOC and HAP emissions are provided in **Appendix C.**

## 4.6 EMISSIONS FROM FUEL STORAGE TANKS [INSIGNICANT]

VOC emissions from storage and transfer of fuel in the diesel fuel storage tank have been estimated utilizing EPA's TANKS 4.09 program. The emissions from this activity are considered insignificant for Title V permitting purposes because the VOC emissions were less than the 2 tpy threshold and HAP emissions were less than the 1,000 lbs/yr threshold.

Calculated VOC and HAP emissions are provided in **Appendix C.**

# 5 APPLICATION FORMS

This Title V permit renewal application has been prepared in accordance with the federal 40 CFR Part 71 regulations. As such, it includes the required EPA Title V forms, emission inventories, a regulatory applicability and compliance review, and other required elements of a Title V application. The following EPA Part 71 forms are provided in **Appendix B**:

- General Information and Summary (GIS)
- Emission Unit Description for Process Sources (EUD3) (for E1 and E2)
- Insignificant Activities (IE)
- Emission Calculations (EMISS)
- Potential to Emit Summary (PTE)
- Compliance Plan and Compliance Certification (I-COMP)
- Certification of Truth, Accuracy, and Completeness (CTAC)

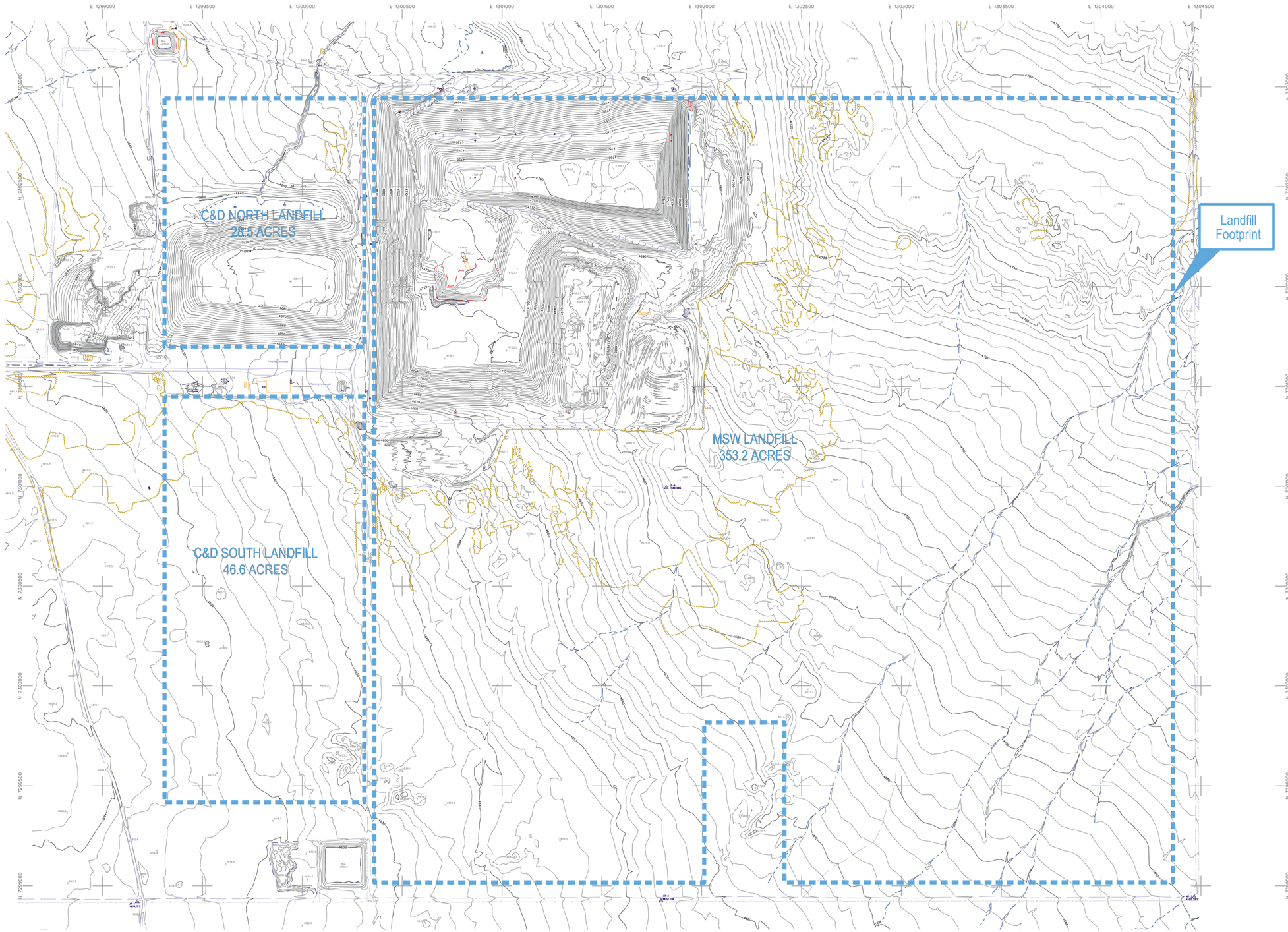
# 6 FEES

Per a telephone communication between SCS and Ms. Noreen Okubo of the USEPA, Region 8, the annual fee calculation and payment due on April 1 each year satisfies all Title V-related fees, with the exception of a one-time GHG Fee Adjustment required, to be paid this year. As such, only that fee is required to be submitted as part of this Title V renewal application process. Ms. Okuba indicated that a Fee Worksheet Form should be completed for that fee, and that payment

should be made under separate cover and documented in this application. The Fee Worksheet Form has been completed and a check for the $520 fee has been submitted to the EPA. A copy of the fee submittal is provided as **Appendix J**.

# Figure 1

# Site Map

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Revisions

| No. | Description | Date | By |
|---|---|---|---|
| | | | |
| | | | |

Approved By: Mark Franc
Checked By:
Drawn By: Corporate Design Services

Project Location:
TEKOI LANDFILL
DUGWAY, UTAH

2015 Topography Dated
February 5, 2015

Drawing No. UT03-2769-AIR-02
Scale: As Shown
Date: April 2015
Sheet Number: 2

Ut03a15_2-5-15.dgn 4/22/2015 10:50:02 AM

# Tables

**TABLE 2**
**FACILITY SIGNIFICANT SOURCE EMISSIONS SUMMARY**
**ACTUAL EMISSIONS AND PTE FOR REGULATED EMISSIONS**
**TEKOI LANDFILL**

**Actual Emissions (2015)**

| | NMOC | NOx | CO | VOC | PM10 | SOx |
|---|---|---|---|---|---|---|
| **Emission Source** | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) |
| E1 | 26.8 | NA | NA | 10.5 | NA | NA |
| E2 | NA | NA | NA | NA | 9.6 | NA |
| **Total** | **26.8** | **0.0** | **0.0** | **10.5** | **9.6** | **0** |

**Potential to Emit Emissions - Regulated (Non-Fugitive) Emissions** [1]

| | NMOC | NOx | CO | VOC | PM10 | SOx |
|---|---|---|---|---|---|---|
| **Emission Source** | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) | (tons/yr) |
| E1 (2019)[2] | 241.4 | NA | NA | 94.1 | NA | NA |
| E2 | NA | NA | NA | NA | NA | NA |
| **Total** | **241.4** | **0.0** | **0.0** | **94.1** | **0.0** | **0.0** |

E1= Emission unit ID

1 For purposes of major source and prevention of significant deterioration (PSD) determination, only non-fugitive emissions are considered.

2 For NMOC and VOC emissions prior to installation of a gas collection and control system, USEPA has indicated that 75% of LFG could be reasonably collected, and as such is not considered to be fugitive emissions. For PTE for NMOC and VOC, maximum non-fugitive emissions are expected to occur in 2019, the final year prior to when a GCCS is required under NSPS to be installed and operating (estimated to be in 2020).

**TABLE 3**
**LANDFILL GAS FUGITIVE EMISSIONS (E1)**
**TEKOI LANDFILL**

| CAS Number | Pollutant | Molecular Weight | Default Concentration In LFG [1] | Actual (2015) Pollutants Generated in LFG [2] | Actual (2015) Pollutants Generated in LFG[2] | Potential to Emit (2019) Pollutants Generated in LFG [2] | Potential to Emit (2019) Fugitive Pollutants [8] | Potential to Emit (2019) Controlled Pollutants [8] |
|---|---|---|---|---|---|---|---|---|
| **Hazardous Air Pollutants (HAPs) [1]** | | **(g/mol)** | **(ppmv)** | **(tons/year)** | **(lbs/year)** | **(tons/year)** | **(tons/year)** | **(tons/year)** |
| 71-55-6 | 1,1,1-Trichloroethane (methyl chloroform) | 133.41 | 0.168 | 7.22E-03 | 1.44E+01 | 2.09E-02 | 5.23E-03 | 1.57E-02 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 167.85 | 0.070 | 3.79E-03 | 7.57E+00 | 1.10E-02 | 2.74E-03 | 8.23E-03 |
| 75-34-3 | 1,1-Dichloroethane (ethylidene dichloride) | 98.97 | 0.741 | 2.36E-02 | 4.73E+01 | 6.85E-02 | 1.71E-02 | 5.14E-02 |
| 75-35-4 | 1,1-Dichloroethene (vinylidene chloride) | 96.94 | 0.092 | 2.87E-03 | 5.75E+00 | 8.33E-03 | 2.08E-03 | 6.25E-03 |
| 107-06-2 | 1,2-Dichloroethane (ethylene dichloride) | 98.96 | 0.120 | 3.83E-03 | 7.65E+00 | 1.11E-02 | 2.77E-03 | 8.32E-03 |
| 78-87-5 | 1,2-Dichloropropane (propylene dichloride) | 112.99 | 0.023 | 8.37E-04 | 1.67E+00 | 2.43E-03 | 6.07E-04 | 1.82E-03 |
| 107-13-1 | Acrylonitrile [3] | 53.06 | 0.036 | 6.15E-04 | 1.23E+00 | 1.78E-03 | 4.46E-04 | 1.34E-03 |
| 71-43-2 | Benzene [4] | 78.11 | 0.972 | 2.45E-02 | 4.89E+01 | 7.09E-02 | 1.77E-02 | 5.32E-02 |
| 75-15-0 | Carbon disulfide | 76.13 | 0.320 | 7.85E-03 | 1.57E+01 | 2.27E-02 | 5.69E-03 | 1.71E-02 |
| 56-23-5 | Carbon tetrachloride [3] | 153.84 | 0.007 | 3.47E-04 | 6.94E-01 | 1.01E-03 | 2.51E-04 | 7.54E-04 |
| 463-58-1 | Carbonyl sulfide | 60.07 | 0.183 | 3.54E-03 | 7.08E+00 | 1.03E-02 | 2.57E-03 | 7.70E-03 |
| 108-90-7 | Chlorobenzene | 112.56 | 0.227 | 8.23E-03 | 1.65E+01 | 2.39E-02 | 5.96E-03 | 1.79E-02 |
| 75-00-3 | Chloroethane (ethyl chloride) | 64.52 | 0.239 | 4.97E-03 | 9.94E+00 | 1.44E-02 | 3.60E-03 | 1.08E-02 |
| 67-66-3 | Chloroform | 119.39 | 0.021 | 8.08E-04 | 1.62E+00 | 2.34E-03 | 5.85E-04 | 1.76E-03 |
| 74-87-3 | Chloromethane (methyl chloride) | 50.49 | 0.249 | 4.05E-03 | 8.10E+00 | 1.17E-02 | 2.93E-03 | 8.80E-03 |
| 106-46-7 | Dichlorobenzene (1,4-Dichlorobenzene) | 147 | 1.607 | 7.61E-02 | 1.52E+02 | 2.21E-01 | 5.51E-02 | 1.65E-01 |
| 75-09-2 | Dichloromethane (Methylene Chloride) | 84.94 | 3.395 | 9.29E-02 | 1.86E+02 | 2.69E-01 | 6.73E-02 | 2.02E-01 |
| 100-41-4 | Ethylbenzene | 106.16 | 6.789 | 2.32E-01 | 4.64E+02 | 6.73E-01 | 1.68E-01 | 5.05E-01 |
| 106-93-4 | Ethylene dibromide (1,2-Dibromoethane) [3] | 187.88 | 0.046 | 2.78E-03 | 5.57E+00 | 8.07E-03 | 2.02E-03 | 6.05E-03 |
| 110-54-3 | Hexane | 86.18 | 2.324 | 6.45E-02 | 1.29E+02 | 1.87E-01 | 4.67E-02 | 1.40E-01 |
| 7439-97-6 | Mercury (total) | 200.61 | 2.92E-04 | 1.89E-05 | 3.77E-02 | 5.47E-05 | 1.37E-05 | 4.10E-05 |
| 78-93-3 | Methyl ethyl ketone | 72.11 | 10.557 | 2.45E-01 | 4.91E+02 | 7.11E-01 | 1.78E-01 | 5.33E-01 |
| 108-10-1 | Methyl isobutyl ketone | 100.16 | 0.75 | 2.42E-02 | 4.84E+01 | 7.01E-02 | 1.75E-02 | 5.26E-02 |
| 127-18-4 | Perchloroethylene (tetrachloroethylene) | 165.83 | 1.193 | 6.37E-02 | 1.27E+02 | 1.85E-01 | 4.62E-02 | 1.39E-01 |
| 108-88-3 | Toluene [4] | 92.13 | 25.405 | **7.54E-01** | 1.51E+03 | 2.19E+00 | 5.46E-01 | 1.64E+00 |
| 79-01-6 | Trichloroethylene (trichloroethene) | 131.40 | 0.681 | 2.88E-02 | 5.77E+01 | 8.35E-02 | 2.09E-02 | 6.27E-02 |
| 75-01-4 | Vinyl chloride | 62.5 | 1.077 | 2.17E-02 | 4.34E+01 | 6.28E-02 | 1.57E-02 | 4.71E-02 |
| 1330-20-7 | Xylenes | 106.16 | 16.582 | **5.67E-01** | 1.13E+03 | 1.64E+00 | 4.11E-01 | 1.23E+00 |
| | **Total HAPs** | | | **2.27** | 4.54E+03 | 6.58 | 1.64 | 4.93 |

| | Pollutant | Molecular Weight | Concentration In LFG | Actual (2015) Pollutants Generated in LFG [2] | Actual (2015) Pollutants Generated in LFG[2] | Potential to Emit (2019) Pollutants Generated in LFG [2] | Potential to Emit (2019) Fugitive Pollutants [8] | Potential to Emit (2019) Controlled Pollutants [8] |
|---|---|---|---|---|---|---|---|---|
| | **Criteria Air Pollutants** | **(g/mol)** | **(ppmv)** | **(tons/year)** | **(lbs/year)** | **(tons/year)** | **(tons/year)** | **(tons/year)** |
| Actual | Volatile Organic Compounds (VOCs) as Hexane [5] | 86.18 | 376 | 10.5 | 20,901 | | | |
| Actual | Total Non-Methane Organics (NMOCs) as Hexane [6] | 86.18 | 965 | 26.8 | 53,593 | | | |
| PTE (2019)[10] | Volatile Organic Compounds (VOCs) as Hexane [5] | 86.18 | 1,560 | | | 125.5 | 31.4 | 94.1 |
| PTE (2019)[10] | Total Non-Methane Organics (NMOCs) as Hexane [9] | 8618% | 4,000 | | | 321.9 | 80.5 | 241.4 |
| PTE (2053)[10] | Volatile Organic Compounds (VOCs) as Hexane [5] | 86.18 | 1,560 | | | 741.9 | 185.5 | 11.1 |
| PTE (2053)[10] | Total Non-Methane Organics (NMOCs) as Hexane [9] | 86.18 | 4,000 | | | 1902.4 | 475.6 | 28.5 |

**Notes:**

(1) List is from AP-42, Section 2.4; Values obtained from WIAC, 2001, except for value for mercury, which was obtained from Table 2.4-1 of AP-42.

(2) Actual emissions are based on LFG generation from the landfill for 2015 with no gas collection. PTE based on 2019 (maximum non-fugitive emissions)

(3) The value shown is the minimum detection limit. These compounds were not detected in MSW-only sites monitored in WIAC study.

(4) Default concentrations for benzene and toluene are based on WIAC values for site with no co-disposal.

(5) For VOCs, 39% by weight of NMOC concentrations assumed per AP-42.

(6) NMOC concentration based on 2013 site-specific Tier 2 test results (965 ppmv as hexane)

(7) scfm based upon USEPA LandGEM estimate using region specific k=(0.020) and $L_0$=(100).

(8) Assumes 75% collection and 98% control of collected LFG, per NSPS requirement to install and operate a gas collection and control system after exceeding 50 MG/yr of uncontrolled NMOC emissions.

(9) AP-42 default NMOC concentration used to estimate maximum potential to emit NMOC emissions.

(10) 2019 is the year of maximum regulated (non-fugitive) emissions (prior to installation of GCCS0; 2053 is year of maximum landfill gas generation.

| **MODEL INPUT VARIABLES** | | |
|---|---|---|
| Actual NMOC concentration in landfill gas [6] | 965 | ppmv as hexane |
| PTE NMOC concentration in landfill gas [9] | 4,000 | ppmv as hexane |
| Methane Content of LFG adjusted to: | 50% | |
| Actual Landfill Gas Generation Rate [7] | 472 | scfm LFG generation in 2015, from LandGEM model) |
| PTE Landfill Gas Generation Rate [7] | 1368 | scfm LFG generation in 2019, from LandGEM model) |
| PTE Landfill Gas Generation Rate [7] | 8086 | scfm LFG generation in 2053, from LandGEM model) |

# TABLE 4
# FUGITIVE DUST EMISSIONS FROM PAVED ROADWAY (E2)
# TEKOI LANDFILL

**Emission Source:** Paved Roadway — Current
**Length of Road:** 7,920 feet
**Round Trip Road Length =** 3.00 miles

**Calculation of Average Vehicle Miles Traveled (VMT)**

| Type of Vehicle | Average Number of Vehicles/Day | Number of Trips Per day | Average VMT (per day) Actual | Average VMT Operational Days/yr[1] | Average VMT (per year) Actual |
|---|---|---|---|---|---|
| **Transfer Trucks** | | | | | |
| Transfer Trucks and Trailers | 9 | 1.0 | 27.0 | 260 | 7,020 |
| **Other Trucks** | | | | | |
| Diesel Fuel Truck[2] | 0.10 | 1.0 | 0.30 | 260 | 78 |
| Service Truck | 1.00 | 1.0 | 3.00 | 260 | 780 |
| 2007 Dodge Dakota | 1.00 | 1.0 | 3.00 | 260 | 780 |
| 2008 F150 | 1.00 | 2.0 | 6.00 | 260 | 1,560 |
| **Private Vehicles** | | | | | |
| Private (Employee Vehicles) | 5 | 1.0 | 15.0 | 260 | 3,900 |
| **TOTALS** | 17 | **7.0** | **54.3** | | **14,118** |

[1] 260 days/yr reflects 5 day work week
[2] Assumes approximately 2 fuel deliveries per month

| Vehicle Type | Average Weight (tons) | Average VMT (per year) | Weight times Annual VMT (tons) |
|---|---|---|---|
| Transfer Trucks and Trailers | 45.0 | 7,020 | 315,900 |
| Diesel Fuel Truck | 19.2 | 78 | 1,498 |
| Service Truck | 16.5 | 780 | 12,870 |
| 2007 Dodge Dakota | 2.5 | 780 | 1,950 |
| 2008 F150 | 2.5 | 1,560 | 3,900 |
| Private (Employee Vehicles) | 2.5 | 3,900 | 9,750 |
| **TOTAL** | | | 345,867.60 |
| | | **Average Vehicle Weight (tons)** | **24.50** |

**Methodologies:**
AP-42, Section 13.2.1-3, Equation (2), for Paved Roads.

$$E = [k(sL)^{0.91} * (W)^{1.02}] * (1-P/4N)$$

**E** = Emission factor in pounds per vehicle mile traveled (lb/VMT)
**k** = Particle size multiplier (lb/VMT)
**sL** = Road surface silt loading factor ($g/m^2$)
**W** = Average Vehicle weight in tons
**P** = Number of days with rain > 0.01 inches
**N** = Averaging period

| **Fugitive Dust Control Measures:** | Control Efficiency |
|---|---|
| Watering Roads as needed: None | 0% |
| Street Sweeping as needed: None | 0% |
| Cumulative Total Control: | 0% |

| Variables: | k factor[1] | Silt loading[2] (sL) | W | P[3] | N (Long Term) |
|---|---|---|---|---|---|
| **Pollutant** | lb/VMT | $g/m^2$ | Tons | days | days |
| **PM-10** | 0.0022 | 7.4 | 24.50 | 90 | 365 |

[1] From AP-42, Table 13.2-1.1
[2] From AP-42, Table 13.2.1-4
[3] From AP-42, Figure 13.2.1-2

**Summary of PM10 Emissions From Roadway Segment PRD-1**

| Pollutant | Emission Factor lb/VMT (daily) | Actual Emissions lbs/day | Actual Emissions tons/yr |
|---|---|---|---|
| PM-10 | **0.3332** | **18.09** | **2.35** |

# TABLE 5
# FUGITIVE DUST EMISSIONS FROM UNPAVED ROADWAY (E2)
# TEKOI LANDFILL

| | Current | Future |
|---|---|---|
| **Emission Source:** Unpaved Roadway (Main Haul Road) | | |
| **Length of Road:** feet | 2,600 feet | 6,000 feet |
| Round Trip Road Length = | 0.98 miles | 2.27 miles |

**Calculation of Average Vehicle Miles Traveled (VMT)**

| Type of Vehicle | Average Number of Vehicles/Day | Number of Trips Per day | Current Average VMT (per day) Actual | Current Average VMT Operational Days/yr[1] | Current Average VMT (per year) Actual | PTE Average VMT (per day) PTE | PTE Average VMT Operational Days/yr[1] | PTE Average VMT (per year) Actual |
|---|---|---|---|---|---|---|---|---|
| **Dozers** | | | | | | | | |
| CAT D5 Dozer | 1 | 1 | 0.98 | 260 | 256 | 2.3 | 260 | 591 |
| CAT D8R | 1 | 1 | 0.98 | 260 | 256 | 2.3 | 260 | 591 |
| **Loaders** | | | | | | | | |
| CAT 950G | 1 | 5 | 4.9 | 260 | 1,280 | 11.4 | 260 | 2,955 |
| Komatsu 250 Loader | 1 | 5 | 4.9 | 260 | 1,280 | 11.4 | 260 | 2,955 |
| **Water Trucks** | | | | | | | | |
| Diesel Water Truck | 1 | 2 | 2.0 | 260 | 512 | 4.5 | 260 | 1,182 |
| **Compactor** | | | | | | | | |
| 826H CAT Compactor | 0 | 0 | 0.0 | 260 | 0 | 0.0 | 260 | 0 |
| **Scraper** | | | | | | | | |
| 627E | 1 | 21 | 20.7 | 260 | 5,377 | 47.7 | 260 | 12,409 |
| **Transfer Trucks** | | | | | | | | |
| Off-Site Transfer Trucks and Trailers | 18 | 1 | 17.7 | 260 | 4,609 | 40.9 | 260 | 10,636 |
| **Other Trucks** | | | | | | | | |
| Site Fuel Truck | 1 | 2 | 2.0 | 260 | 512 | 4.5 | 260 | 1,182 |
| Yard Truck | 1 | 24 | 23.6 | 260 | 6,145 | 54.5 | 260 | 14,182 |
| Yard Truck (spare) | 1 | 0 | 0.0 | 260 | 0 | 0.0 | 260 | 0 |
| Ford F150 | 1 | 3 | 3.0 | 260 | 768 | 6.8 | 260 | 1,773 |
| Service Truck | 1 | 2 | 2.0 | 260 | 512 | 4.5 | 260 | 1,182 |
| **Private Vehicles** | | | | | | | | |
| Private (Employee Vehicles) | 5 | 2 | 9.8 | 260 | 2,561 | 23 | 260 | 5,909 |
| **TOTALS** | **34** | **69** | **93** | | **24,070** | **214** | | **55,545** |

# TABLE 5
# FUGITIVE DUST EMISSIONS FROM UNPAVED ROADWAY (E2)
# TEKOI LANDFILL

[1] 260 days/yr reflects 5 day work week

[2]Remains in trash area.

| Vehicle Type | Average Weight (tons) | Average VMT (per year) | Weight times Annual VMT (tons) |
|---|---|---|---|
| **Dozers** | | | |
| CAT D5 Dozer | 13.39 | 256.1 | 3,429 |
| CAT D8R1 | 41.7 | 256.1 | 10,678 |
| **Loaders** | | | |
| CAT 950G | 18.6 | 1,280 | 23,852 |
| Komatsu 250 Loader | 8.0 | 1,280 | 10,242 |
| **Water Trucks** | | | |
| Diesel Water Truck | 35.9 | 512 | 18,375 |
| CAT 826H Compactor | 40.8 | 0 | 0 |
| **Scraper** | | | |
| 627E | 38.2 | 5,377 | 205,519 |
| **Transfer Trucks** | | | |
| Off-Site Transfer Trucks and Trailers | 26.0 | 4,609 | 119,836 |
| **Other Trucks** | | | |
| Site Fuel Truck | 35.9 | 512 | 18,375 |
| Yard Truck AM Generator | 4.4 | 6,145 | 27,040 |
| Yard Truck (Mack MR6885 - spare) | 4.4 | 0 | 0 |
| Ford F150 (2008) | 3.1 | 768 | 2,389 |
| Service Truck | 12.8 | 512 | 6,550 |
| **Private Vehicles** | | | |
| Private (Employee Vehicles) | 2.5 | 2,561 | 6,402 |
| **TOTAL** | | | **442,857** |
| | | **Average Vehicle Weight (tons)** | **18.40** |

**Methodologies:**

AP-42, Section 13.2.2.2, Equation (1a), for Unpaved Roads at Industrial Sites.

# TABLE 5
# FUGITIVE DUST EMISSIONS FROM UNPAVED ROADWAY (E2)
# TEKOI LANDFILL

$$E = k(s/12)^a * (W/3)^b * [(365-P)/365]$$

| | | |
|---|---|---|
| **E** | = | Emission factor in pounds per vehicle mile traveled (lb/VMT) |
| **k** | = | Particle size multiplier (lb/VMT) |
| **a** | = | Empirical Constant from Table 13.2.2-2 |
| **b** | = | Empirical Constant from Table 13.2.2-2 |
| **s** | = | Surface material silt content (%) |
| **W** | = | Average Vehicle weight in tons |
| **P** | = | Number of days with rain > 0.01 inches |

| **Fugitive Dust Control Measures:** | Control Efficiency | Source: |
|---|---|---|
| Watering Roads as needed: | 80% | EPA: *AP-42, Section 13.2.2.3* |
| Chemical Dust Suppressants: None | 0% | |
| Cumulative Total Control: | 80% | |

| **Variables:** | **k factor[1]** | **a** | **b** | **Surface Silt Content[2] (%)** | **W** | **P[3]** |
|---|---|---|---|---|---|---|
| **Pollutant** | lb/VMT | | | (%) | Tons | days |
| **PM-10** | 1.5 | 0.9 | 0.45 | 6.4 | 18.40 | 90 |
| **PM-2.5** | 0.15 | 0.9 | 0.45 | 6.4 | 18.40 | 90 |
| **TSP** | 4.9 | 0.7 | 0.45 | 6.4 | 18.40 | 90 |

[1] From AP-42, Section 13.2.1.3
[2] AP-42 (Table 13.2.2-1) mean silt content for municipal solid waste landfills
[3] From AP-42, Figure 13.2.1-2

**Summary of PM10 Emissions From Roadway Segment UPR-2**

| | Emission Factor lb/VMT (daily) | Actual Emissions | | Emissions - Future Road Lengt | | Increase |
|---|---|---|---|---|---|---|
| **Pollutant** | | lbs/day | tons/yr | lbs/day | tons/yr | tons/yr |
| **PM-10** | 1.4517 | 26.88 | **3.49** | 62.03 | **8.06** | **4.57** |

# TABLE 6
# FUGITIVE DUST EMISSIONS FROM MATERIAL HANDLING (E2)
# TEKOI LANDFILL

According to AP-42, Section 13.2.4, Aggregate Handling and Storage Piles:

AP-42, Section 13.2.4.3 Predictive Emission Factor Equations (11/06)

Total dust emissions from aggregate storage piles result from several distinct source activities within the storage cycle:

1. Loading of aggregate onto storage piles (batch or continous drop operations).
2. Equipment traffic in storage area.
3. Wind erosion of pile surfaces and ground areas around piles.
4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous).

Either adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front-end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

The quantity of particulate matter emissions generated by either type of drop operation may be estimated using equation 1.

$$E = k(0.0032)\,[(G/5)^{1.3}]/[(H/2)^{1.4}]$$

E = Emission Factor, lb/ton
k = particle size multiplier (dimensionless) (Section 13.2.4.3)
G = mean wind speed, miles per hour (mph)
H = Material moisture content (%) (Table 13.2.4-1)

**Particle Size Multiplier, k**

| Particle Size | k |
|---|---|
| PM-10 | 0.35 |
| PM-2.5 | 0.053 |
| PM-30 (TSP) | 0.74 |

**Mean Wind Speed, U**

Based on Meteorological Data from Salt Lake City International Airport

| | Wind Speed (mph) |
|---|---|
| **Average** | **5.00** |

**Material Moisture Content, %**

For municipal Solid Waste Landfills (cover material)
M = 12% (mean)

***Emission Factor Calculation***

For PM-10: $E = [(0.35) * (0.0032) * [(8.60/5)^{1.3} / (0.12/2)^{1.4}]$

$E =$ 0.0575 lb/ton

For PM-2.5 $E = [(0.053) * (0.0032) * [(8.60/5)^{1.3} / (0.12/2)^{1.4}]$

$E =$ 0.0087 lb/ton

For PM-30 (TSP): $E = [(0.74) * (0.0032) * [(8.60/5)^{1.3} / (0.12/2)^{1.4}]$

$E =$ 0.1216 lb/ton

## Fugitive Dust from Material Handling

| | Actual | |
|---|---|---|
| Estimated Density of Soil Cover: | 2,400 | lbs/yd$^3$ |
| Estimated Density of ADC: | 1,080 | lb/yd3 |
| Percent of soil/ADC to refuse: | 35% | |
| Current Average Disposal Rate: | 738 | tpd |
| Estimated Density of Refuse: | 1,465 | lb/yd$^3$ |
| Volume of Refuse Disposed: | 1,008 | yd$^3$/day |
| | | |
| Amount of Cover Used = | 353 | yd$^3$ of soil/ADC cover used |
| | 0 | tons/day ADC cover used |
| | 423 | tons/day soil cover used |
| | 110,020 | tons/yr soil cover used |
| | 21 | scraper loads per day assuming each scraper is 17 cubic yards |

| | Actual | |
|---|---|---|
| **PM-10 Emissions =** | **7,593.80** | **lb/yr** |
| | **24.34** | **lb/day** |
| | **3.80** | **ton/yr** |

# APPENDICES

# Appendix A

## Current Part 71 Operating Permit

**United States Environmental Protection Agency**
**Region 8**
**Air Program**
**1595 Wynkoop Street**
**Denver, Colorado 80202**

## AIR POLLUTION CONTROL
## TITLE V PERMIT TO OPERATE

In accordance with the provisions of title V of the Clean Air Act and 40 CFR part 71 and applicable rules and regulations,

**Waste Management of Utah, Inc.**
**Tekoi Landfill**

is authorized to operate air emission units and to conduct other air pollutant emitting activities in accordance with the permit conditions listed in this permit.

This source is authorized to operate at the following location:

**Section 18, Township 5 South, Range 8 West**
**on the Skull Valley Band Goshute Indian Reservation**
**Tooele County, Utah**

Terms not otherwise defined in this permit have the meaning assigned to them in the referenced regulations. All terms and conditions of the permit are enforceable by EPA and citizens under the Clean Air Act.

Carl Daly, Director
Air Program
US EPA Region 8

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**AIR POLLUTION CONTROL**
**TITLE V PERMIT TO OPERATE**
**Waste Management of Utah, LLC**
**Tekoi Landfill**

| | | |
|---|---|---|
| Permit Number: V-SV-00001-2010.00 | Issue Date: | September 12, 2011 |
| Replaces Permit No.: NA | Effective Date: | September 22, 2011 |
| | Expiration Date: | September 22, 2016 |

The permit number cited above should be referenced in future correspondence regarding this facility.

**Permit Issuance History**

| DATE OF ISSUANCE | TYPE OF ACTION | SECTION NUMBER AND TITLE | DESCRIPTION OF ACTION |
|---|---|---|---|
| September 2011 | Initial Permit Issuance | | **Permit: V-SV-00001-2010.00** |

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## Abbreviations and Acronyms

| | |
|---|---|
| AR | Acid Rain |
| ARP | Acid Rain Program |
| bbls | Barrels |
| BACT | Best Available Control Technology |
| CAA | Clean Air Act [42 U.S.C. Section 7401 et seq.] |
| CAM | Compliance Assurance Monitoring |
| CEMS | Continuous Emission Monitoring System |
| CI | Compression Ignition |
| CFR | Code of Federal Regulations |
| CMS | Continuous Monitoring System (includes COMS, CEMS and diluent monitoring) |
| COMS | Continuous Opacity Monitoring System |
| CO | Carbon monoxide |
| $CO_2$ | Carbon dioxide |
| DAHS | Data Acquisition and Handling System |
| dscf | Dry standard cubic foot |
| dscm | Dry standard cubic meter |
| EIP | Economic Incentives Programs |
| EPA | Environmental Protection Agency |
| FGD | Flue gas desulfurization |
| gal | Gallon |
| GPM | Gallons per minute |
| $H_2S$ | Hydrogen sulfide |
| HAP | Hazardous Air Pollutant |
| hr | Hour |
| Id. No. | Identification Number |
| kg | Kilogram |
| lb | Pound |
| MACT | Maximum Achievable Control Technology |
| MVAC | Motor Vehicle Air Conditioner |
| Mg | Megagram |
| MMBtu | Million British Thermal Units |
| mo | Month |
| NESHAP | National Emission Standards for Hazardous Air Pollutants |
| NMHC | Non-methane hydrocarbons |
| NMOC | Non-methane organic compounds |
| $NO_x$ | Nitrogen Oxides |
| NSPS | New Source Performance Standard |
| NSR | New Source Review |
| pH | Negative logarithm of effective hydrogen ion concentration (acidity) |
| PM | Particulate Matter |
| $PM_{10}$ | Particulate matter less than 10 microns in diameter |
| ppm | Parts per million |
| PSD | Prevention of Significant Deterioration |
| PTE | Potential to Emit |
| psi | Pounds per square inch |
| psia | Pounds per square inch absolute |
| RICE | Reciprocating Internal Combustion Engine |
| RMP | Risk Management Plan |
| scfm | Standard cubic feet per minute |
| SNAP | Significant New Alternatives Program |
| $SO_2$ | Sulfur Dioxide |
| tpy | Ton Per Year |
| US EPA | United States Environmental Protection Agency |
| VOC | Volatile Organic Compounds |

## List of Tables

Table 1. Emission Units.....2
Table 2. Insignificant Emission Units .....2

# I. Source Information and Emission Unit Identification

## I.A. Source Information

| | |
|---|---|
| **Parent Company Name:** | Waste Management of Utah, Inc. |
| **Plant Name:** | Tekoi Landfill |
| **Plant Location:** | Section 18, Township 5 South, Range 8 West<br>Latitude: 40.358323 N<br>Longitude: 112.724416 W |
| **Region:** | 8 |
| **State:** | Utah |
| **County:** | Tooele |
| **Reservation:** | Skull Valley Band Goshute Indian Community |
| **Tribe:** | Skull Valley Band of Goshute Indians |
| **Responsible Official:** | Area Vice President |
| **SIC Code:** | 4953 |

**AFS Plant Identification Number:** 49-045-00088

**Other Clean Air Act Permits:** There are no other Federal Clean Air Act permits, such as PSD or minor NSR, issued to this facility.

**Description of Process:**

The Tekoi Landfill (TLF), which is owned by the Skull Valley Band of Goshute Indian Community (SVBGIC) and operated by Waste Management of Utah, Inc (WM), serves as a regional municipal solid waste (MSW) and construction and demolition (C&D) debris disposal facility.

No hazardous wastes or infectious wastes are accepted for disposal, nor is the incineration of waste permitted. TLF currently accepts approximately 785 tons of waste per day (tpd); however, it is permitted to accept a maximum of 4,000 tpd with a design capacity of 45 million cubic meters.

The landfill is comprised of a 6-Phase MSW disposal area and a North and South C&D disposal area. The MSW portion of the landfill was operated as a balefill landfill until November 2010. A balefill is a type of landfill in which MSW is mechanically baled before being placed in the facility. The bales are approximately 45" x 45" x 60" and weigh approximately 4,000 pounds. The site now accepts only loose (unbaled) MSW. The method of disposal has no effect on landfill emissions.

This process description is provided for informational purposes only, and is not a basis for any enforceable limiting conditions unless explicitly stated.

## I.B. Source Emission Points

### Table 1 - Emission Units
### Waste Management, Tekoi Landfill

| Emission Unit ID | Description | Control Equipment |
|---|---|---|
| E1 | MSW Landfill: 45 million cubic meters design capacity.<br>Construction Date: 01/14/2005 | None<br>(NMOC <50 Mg/year) |
| E2 | Fugitive Dust Emissions from Paved Roads, Unpaved Roads, and Material Handling | None |

### Table 2 -- Insignificant Emission Units*
### Waste Management, Tekoi Landfill

| Emission Unit ID | Description |
|---|---|
| IE1 | Isuzu; 55.2 hp diesel-fired stationary compression ignition engine.<br>Construction Date: Pre June 12, 2006; Manufactured 2000.<br>Use: ~140 hrs/year; Non-emergency diesel fuel pump |
| IE2 | John Deere (6.8L); 150 hp diesel-fired stationary compression ignition engine.<br>Construction Date: Pre June 12, 2006; Manufactured 2002.<br>Use: ~420 hrs/year; Non-emergency generator to power lights. |
| IE3 | Subaru-Robin; 11 hp diesel-fired stationary compression ignition engine.<br>Construction Date: Post June 12, 2006; Manufactured 2007.<br>Use: ~420 hrs/year; Non-emergency water pump. |
| IE4 | 1 - 12,000 gallon diesel fuel tank |
| IE5 | 1 - 500 gallon engine oil tank |

*Insignificant emission units can change at the facility as long as the new or replacement units meet the criteria for insignificance, and TLF supplies information as required under 40 CFR part 71 and this permit. The insignificant emission unit status does not exempt these emission units from the requirements of the NSPS and MACT standards that may apply.

## II. Standards of Performance for Municipal Solid Waste Landfills

### II.A. 40 CFR Part 60, Subpart A – General Provisions

This facility is subject to the requirements of 40 CFR part 60, subpart A as stated in §60.1. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 60, subpart A.

[40 CFR 60.1 - 60.19]

### II.B. 40 CFR Part 60, Subpart WWW - Standards

1. This facility is subject to the requirements of 40 CFR part 60, subpart WWW. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 60, subpart WWW.

2. 40 CFR 60, Subpart WWW applies as follows:

   (a) §60.750(a) - This facility is a MSW landfill that was constructed, reconstructed or modified on or after May 30, 1991; and

   (b) §60.752(b) – This facility has a design capacity greater than 2.5 million megagrams.

[40 CFR 60.750 - 60.759]

### II.C. Standards for Air Emissions

1. The permittee shall calculate an NMOC emission rate for the landfill using the procedure and default values specified in §60.754(a)(1).

[40 CFR 60.752(b)]

2. **Tier 1**: The permittee shall compare the calculated NMOC mass emission rate to the standard of 50 megagrams per year as required by §60.754(a)(2).

   (a) If the calculated NMOC emission rate is less than 50 megagrams per year using Tier 1, the permittee shall:

      (i) Submit an emission rate report as provided in §60.757(b)(1); and
      (ii) Recalculate the NMOC mass emission rate annually using the procedure and default values specified in §60.754(a)(1) and using Tier 1 as specified in §60.754(a)(2) until such time as the calculated emission rate is equal to or greater than 50 megagrams per year or the landfill is closed.

[40 CFR 60.752(b)(1) and 40 CFR 60.754(a)(1)(i)]

(b) If the calculated NMOC emission rate using the default values of §60.754(a)(1) is equal to or greater than 50 megagrams per year using Tier 1, the permittee shall either:

(i) Comply with §60.752(b)(2) as follows:

(A) Submit a collection and control system design plan prepared by a professional engineer within 1 year; and
(B) Install a collection and control system, as specified in §60.752(b)(2)(ii)(A) or (B) and §60.752(b)(2)(iii), within 30 months after the first annual report in which the rate equals or exceeds 50 megagram per year; and
(C) Comply with the specifications for active collection systems as specified in §60.759.

or

(ii) Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the procedures provided in paragraph §60.754(a)(3) and identified as Tier 2.

[40 CFR 60.752(b)(2) and 40 CFR 60.754(a)(1)(ii)]

3. **Tier 2**: The permittee shall calculate a site-specific NMOC concentration as required by §60.754(a)(3) and recalculate the NMOC mass emission rate using the equations provided in §60.754(a)(1) using the average NMOC concentration from the collected samples instead of the default value in the equation in §60.754(a)(1).

(a) If the resulting NMOC mass emission rate is less than 50 megagrams per year using Tier 2, the permittee shall:

(i) Submit a periodic estimate of the emission rate report as provided in §60.757(b)(1); and
(ii) Retest the site-specific NMOC concentration every 5 years using Tier 2.

[40 CFR 60.754(a)(3)(i)]

(b) If the resulting NMOC mass emission rate is equal to or greater than 50 megagrams per year using Tier 2, the permittee shall either:

(i) Comply with §60.752(b)(2) as follows:

(A) Submit a collection and control system design plan prepared by a professional engineer within 1 year; and
(B) Install a collection and control system, as specified in §60.752(b)(2)(ii)(A) or (B) and §60.752(b)(2)(iii), within 30 months after the first annual report in which the rate equals or exceeds 50 megagram per year; ; and
(C) Comply with the specifications for active collection systems as specified in §60.759.

or

(ii) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the procedures specified in paragraph §60.754(a)(4) and identified as Tier 3.

[40 CFR 60.752(b)(2) and 40 CFR 60.754(a)(3)(ii)]

4. **Tier 3**: The permittee shall determine the site-specific methane generation rate constant as required by §60.754(a)(4) and recalculate the NMOC mass emission rate using the site-specific methane generation rate constant, the NMOC concentration previously determined by Tier 2, and the equations provided in §60.754(a)(1).

(a) If the resulting NMOC mass emission rate is less than 50 megagrams per year using Tier 3, the permittee shall:

(i) Submit a periodic emission rate report as provided in §60.757(b)(1); and
(ii) Recalculate the NMOC emission rate annually as provided in §60.757(b)(1) using the equations in paragraph §60.754(a)(1), the site-specific methane generation rate constant, and NMOC concentration rate obtained by Tier 2 every 5 years. The site-specific methane generation rate constant is performed only once, and the value obtained from this test shall be used in all subsequent annual NMOC emission rate calculations.

[40 CFR 60.754(a)(4)(ii)]

(b) If the resulting NMOC mass emission rate is equal to or greater than 50 megagrams per year using Tier 3, the permittee shall comply with §60.752(b)(2) as follows:

(A) Submit a collection and control system design plan prepared by a professional engineer within 1 year; and
(B) Install a collection and control system, as specified in §60.752(b)(2)(ii)(A) or (B) and §60.752(b)(2)(iii), within 30 months after the first annual report in which the rate equals or exceeds 50 megagram per year ; and
(C) Comply with the specifications for active collection systems as specified in §60.759.

[40 CFR 60.752(b)(2) and 40 CFR 60.754(a)(4)(i)]

**II.D. Compliance Provisions** [40 CFR 60.755]

The specified methods in §60.755(a)(1) - (a)(6) shall be used to determine whether the gas collection and control system is in compliance with §60.752(b)(2)(ii).

**II.E. Monitoring of Operations** [40 CFR 60.756]

The requirements of §60.756(a) - (f) shall be used to monitor the capture and control system requirements of §60.752(b)(2).

## II.F. **Reporting Requirements** [40 CFR 60.757]

If the NMOC emission rate equals or exceeds 50 megagrams per year, the permittee shall meet the applicable reporting requirements of §60.757(a) - (g).

## II.G. **Recordkeeping Requirements** [40 CFR 60.758]

The permittee shall meet the applicable recordkeeping requirements of §60.758(a) - (f).

## III. 40 CFR Part 63, Subpart AAAA – National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste(MSW) Landfills

### III.A. 40 CFR Part 63, Subpart A – General Provisions

This facility is subject to the requirements of 40 CFR part 63, subpart A as stated in Table 1 of 40 CFR part 63, subpart AAAA and §§63.1960 through 63.1985. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 63, subpart A.

[40 CFR 63.1 - 63.16 and 40 CFR 63.1955(d)(1)]

### III.B. 40 CFR 63, Subpart AAAA - Standards

1. This facility is subject to the requirements of 40 CFR part 63, subpart AAAA. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 63, subpart AAAA.

2. 40 CFR 63, Subpart AAAA applies as follows:

   (a) §63.1935(a) - This facility is a MSW landfill that has accepted waste since November 8, 1987 or has additional capacity for waste deposition; and

   (b) §63.1935(a)(3) – This facility has a design capacity greater than 2.5 million megagrams and is an area source MSW landfill.

[40 CFR 63.1930 – 63.1990]

### III.C. Non-Methane Organic Compound Emission Rate < 50 Mg/year

If the uncontrolled non-methane organic compound (NMOC) emission rate is less than 50 megagrams per year, as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the permittee shall recalculate the NMOC emission rate annually as specified in 40 CFR 60.752(b)(1) using the procedures specified in 40 CFR 60.754(a)(1) until such time as the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, or the landfill is closed.

[40 CFR 63.1935(a)(3)]

*[Explanatory note: The requirements of 40 CFR part 60, subpart WWW are summarized in the Standards of Performance for Municipal Solid Waste Landfills requirements in this permit.]*

### III.D. Non-Methane Organic Compound Emission Rate ≥ 50 Mg/year

If the uncontrolled non-methane organic compound (NMOC) emission rate is equal to or greater than 50 megagrams per year, as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the permittee shall comply with 40 CFR part 63, subpart AAAA by meeting the standards, monitoring, recordkeeping and reporting requirements as specified in 40 CFR part 60, subpart WWW in addition to the following standards, monitoring, recordkeeping and reporting requirements that apply to the facility.

*[Explanatory note: The requirements of 40 CFR part 60, subpart WWW are summarized in the Standards of Performance for Municipal Solid Waste Landfills requirements in this permit.]*

1. **Standards for Air Emissions**

(a) The permittee shall comply with the requirements of 40 CFR part 60, subpart WWW.

[40 CFR 63.1955(a)]

(b) If the permittee is required by 40 CFR 60.752(b)(2) of 40 CFR part 60, subpart WWW to install a collection and control system, the permittee must comply with the requirements in §§63.1960 through 63.1985, and with the general provisions as specified in Table 1 of 40 CFR part 63, subpart AAAA.

[40 CFR 63.1955(b)]

(c) For approval of collection and control systems that include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions, the permittee must follow the procedures in 40 CFR 60.752(b)(2). If alternatives have already been approved under 40 CFR part 60, subpart WWW, these alternatives can be used to comply with 40 CFR 63, subpart AAAA, except as specified in 63.1955(c).

[40 CFR 63.1955(c)]

2. **Compliance Provisions** [40 CFR 63.1960]

Compliance shall be determined by the requirements of §63.1960.

3. **Monitoring and Testing** [40 CFR 63.1980(g)]

If the permittee adds any liquids other than leachate in a controlled fashion to the waste mass and does not comply with the bioreactor requirements in §§63.1947, 63.1955(c) and 63.1980(c) through (f) of 40 CFR part 63, subpart AAAA, the permittee must keep a record of calculations as specified in §63.1980(g).

4. **Recordkeeping and Reporting Requirements**

(a) The permittee must comply with the recordkeeping requirements as specified in §60.758(a) of 40 CFR part 60, subpart WWW, except that the annual report described in 40 CFR §60.757(f) must be submitted every 6 months.

[40 CFR 63.1980(a)]

(b) The permittee must keep records and reports as specified in the general provisions of 40 CFR part 60 and in Table 1 of 40 CFR part 63, subpart AAAA. Applicable records in the general provisions include items such as startup, shutdown and malfunction (SSM) plans and the SSM plan reports.

[40 CFR 63.1980(b)]

## IV. 40 CFR Part 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants from Reciprocating Internal Combustion Engines

### IV.A. 40 CFR Part 63, Subpart A - General Provisions [40 CFR 63.1 - 63.16]

This facility is subject to the requirements of 40 CFR part 63, subpart A as outlined in Table 8 of 40 CFR part 63, subpart ZZZZ. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 63, subpart A.

[40 CFR 63.6665 and Table 8]

### IV.B. 40 CFR Part 63, Subpart ZZZZ – Standards

1. This facility is subject to the requirements of 40 CFR part 63, subpart ZZZZ for stationary reciprocating internal combustion engines (RICE). Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 63, subpart ZZZZ.

2. 40 CFR part 63, subpart ZZZZ applies to the following stationary engines:

   IE1: Isuzu; 55.2 hp diesel-fired compression ignition engine.
   Construction Date: Pre June 12, 2006; Manufactured 2000.
   Compliance Date: May 3, 2013.

   IE2: John Deere (6.8L); 150 hp diesel-fired compression ignition engine.
   Construction Date: Pre June 12, 2006; Manufactured 2002.
   Compliance Date: May 3, 2013.

   IE3: Subaru-Robin; 11 hp diesel-fired compression ignition engine.
   Construction Date: Post June 12, 2006; Manufactured 2007.
   Compliance Date: Upon Start-up.

[40 CFR 63.6585 - 63.6590]

### IV.C. Requirements for Engine IE3

1. The permittee must meet the requirements of 40 CFR part 63, subpart ZZZZ by meeting the requirements of 40 CFR part 60, subpart IIII, for stationary CI engines. No further requirements apply to engine unit IE3 under 40 CFR part 63.

   [40 CFR 63.6590(c) and 40 CFR 63.6590(c)(1)]

2. Pursuant to 40 CFR part 60, subpart IIII, this engine is subject to 40 CFR part 60, subpart IIII, as it was manufactured after April 1, 2006. As such, there are additional requirements outlined in this permit that apply to this engine.

   [40 CFR 60.4200(a)(2)(i)]

### IV.D. Requirements for Engines IE1 and IE2

1. Emission and Operating Limitations

   a. Except during periods of startup, the permittee shall:

i. Change oil and filter every 1,000 hours of operation or annually, whichever comes first;

ii. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first;

iii. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

b. During periods of startup the permittee shall minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.

[40 CFR 63.6603(a) and Table 2d: 1(a)-(b)]

2. Operation and Maintenance

The permittee must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop a maintenance plan which must provide, to the extent practicable, for the maintenance and operation of the engine in a manner consistent with good air pollution control practices for minimizing emissions.

[40 CFR 66.6625(e) and Table 6: 9(a)(i)-(ii)]

3. Compliance Requirements

a. The permittee must:

i. Be in compliance with the emission limitations and operating limitations, which apply, at all times.

[40 CFR 63.6605(a)]

ii. Operate and maintain the engines, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions, at all times.

[40 CFR 63.6605(b)]

iii. Demonstrate continuous compliance with each emission limitation and operating limitation that apply.

[40 CFR 63.6640 (a)]

b. For new, reconstructed, and rebuilt stationary RICE, deviations from the emission or operating limitations that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations. Rebuilt stationary RICE means a stationary RICE that has been rebuilt as that term is defined in 40 CFR 94.11(a).

[40 CFR 63.6640 (d)]

4. Recordkeeping

a. The permittee must keep records of operation and maintenance to show continuous compliance with each emission or operating limitation and to demonstrate that the engine was operated and maintained according to the required maintenance plan.

[40 CFR 63.6655 (d)-(e)]

b. Records must be in a form suitable and readily available for expeditious review according to §63.10(b)(1).

[40 CFR 63.6660(a)]

c. Each record must be kept for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

[40 CFR 63.6660(b)]

d. Each record must be readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.10(b)(1).

[40 CFR 63.6660(c)]

## V. 40 CFR Part 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

### V.A. 40 CFR 60, Subpart A – General Provisions [40 CFR 60.1 - 60.19]

This facility is subject to the requirements of 40 CFR part 60, subpart A as outlined in Table 8 of 40 CFR 60, subpart IIII. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 60, subpart A.

[40 CFR 60.4218 and Table 8]

### V.B. 40 CFR 60, Subpart IIII – Standards

1. This facility is subject to the requirements of 40 CFR part 60, subpart IIII. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 60, subpart IIII.

2. 40 CFR part 60, subpart IIII applies to the following engines:

   IE1: Isuzu; 55.2 hp diesel-fired compression ignition engine.
   Model Year: Pre 2007; Manufactured 2000.
   Compliance Date: May 3, 2013.

   IE2: John Deere (6.8L); 150 hp diesel-fired compression ignition engine; EPA Tier 2 Certified for NOx.
   Model Year: Pre 2007; Manufactured 2002.
   Compliance Date: May 3, 2013.

   IE3: Subaru-Robin; 11 hp diesel-fired compression ignition engine.
   Model Year: 2007; Manufactured 2007.
   Compliance Date: Upon Start-up.

[40 CFR 60.4200]

### V.C. Requirements for Engines IE1 and IE2

1. Emission Standards

The permittee, as an owner or operator of pre-2007 model year non-emergency stationary compression ignition internal combustion engines (CI ICE) with a displacement of less than 10 liters per cylinder, must comply with the emission standards in the following table.

| Emission standards for stationary pre-2007 model year engines with a displacement of <10 liters per cylinder (g/hp-hr) | | | | | | |
|---|---|---|---|---|---|---|
| **Maximum Engine Power** | **Engine** | **NMHC + $NO_X$** | **HC** | **$NO_X$** | **CO** | **PM** |
| (50≤hp<75) | IE1 | | | 6.9 | | |
| (100≤hp<175) | IE2 | | | 6.9 | | |

[40 CFR 60.4204 and Table 1]

2. Compliance Requirements

a. The permittee, as the owner or operator of the CI ICE, must

i. Comply with the emission standards;
ii. Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed and approved by the engine manufacturer;
iii. Only change those settings that are permitted by the manufacturer; and
iv. Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

[40 CFR 60.4211(a)]

b. The permittee, as the owner or operator of a pre-2007 model year stationary CI ICE who must comply with the emission standards specified in §60.4204(a), must demonstrate compliance according to one of the following methods:

i. Purchase an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications;
ii. Keep records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in 40 CFR part 60, subpart IIII and these methods must have been followed correctly;
iii. Keep records of engine manufacturer data indicating compliance with the standards;
iv. Keep records of control device vendor data indicating compliance with the standards; or
v. Conduct an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in §60.4212, as applicable.

[40 CFR 60.4211 (b)]

## V.D. Requirements for Engine IE3

1. Emission Standards

   a. The permittee, as the owner or operator of 2007 model year and later non-emergency stationary CI ICE with a displacement of less than 30 liters per cylinder, must comply with the manufacturer certification emission standards for new CI ICE in §60.4201 for their 2007 model year and later stationary CI ICE, as applicable.

   [40 CFR 60.4204(b)]

   b. Stationary CI ICE manufacturers must certify their 2007 model year and later non-emergency stationary CI ICE with a maximum engine power less than or equal to 3,000 hp and a displacement of less than 10 liters per cylinder to the certification emission standards for new non-road CI engines in 40 CFR 89.112, 40 CFR 89.113, 40 CFR 1039.101, 40 CFR 1039.102, 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR 1039.107, and 40 CFR 1039.115, as applicable, for all pollutants, for the same model year and maximum engine power.

   [40 CFR 60.4201(a)]

2. Fuel Usage Requirements

   Beginning October 1, 2010, the permittee, as an owner or operator of stationary CI ICE subject to 40 CFR part 60, subpart IIII with a displacement of less than 30 liters per cylinder that use diesel fuel, must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel.

   [40 CFR 60.4207(b)]

3. Compliance Requirements

   a. The permittee, as an owner or operator of stationary CI ICE subject to 40 CFR part 60. Subpart III, must meet the following compliance requirements:

      i. Comply with the emission standards;
      ii. Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed and approved by the engine manufacturer;
      iii. Only change those settings that are permitted by the manufacturer; and
      iv. Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

      [40 CFR 60.4211(a)]

   b. The permittee, as an owner or operator of a 2007 model year and later stationary CI internal combustion engine, must comply by purchasing an engine certified to the emission standards in §60.4204(b), as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.

   [40 CFR 60.4211(c)]

## VI. Facility-Wide Requirements

Conditions in this section of the permit apply to all emissions units located at the facility, including any units not specifically listed in this permit.

[40 CFR 71.6(a)(1)]

**VI.A. General Recordkeeping Requirements** [40 CFR 71.6(a)(3)(ii) and 63.10(b)(3)]

The permittee shall comply with the following generally applicable recordkeeping requirements:

1. If the permittee determines that his or her stationary source that emits (or has the potential to emit, without federally recognized controls) one or more hazardous air pollutants that is not subject to a relevant standard or other requirement established under 40 CFR part 63, the permittee shall keep a record of the applicability determination on site at the source for a period of five (5) years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The record of the applicability determination shall include an analysis (or other information) that demonstrates why the permittee believes the source is unaffected (e.g., because the source is an area source).

[40 CFR 63.10(b)(3)]

**VI.B. General Reporting Requirements** [40 CFR 71.6(a)(3)(iii)]

This permit was issued Sept 22, 2011? This cannot be correct

1. The permittee shall submit to the EPA Regional Office all reports of any required monitoring under this permit semi-annually. Reports shall be submitted by April 1st and October 1st of each year. The first report due on October 1, 2011 shall cover the period from the effective date of this permit through August 31, 2011. Thereafter, the report due on April 1st shall cover the six-month period ending on the last day of February before the report is due. The report due on October 1st shall cover the six-month period ending on the last day of August before the report is due. All instances of deviations from permit requirements shall be clearly identified in such reports.

*[Explanatory note: To help part 71 permittees meet reporting responsibilities, EPA has developed a form "SIXMON" for six-month monitoring reports. The form may be found on the EPA website at: http://www.epa.gov/air/oaqps/permits/p71forms.html]*

2. "Deviation" means any situation in which an emissions unit fails to meet a permit term or condition. A deviation is not always a violation. A deviation can be determined by observation or through review of data obtained from any testing, monitoring, or recordkeeping established in accordance with §71.6(a)(3)(i) and (a)(3)(ii). For a situation lasting more than 24 hours which constitutes a deviation, each 24 hour period is considered a separate deviation. Included in the meaning of deviation are any of the following:

   (a) A situation where emissions exceed an emission limitation or standard;

   (b) A situation where process or emissions control device parameter values indicate that an emission limitation or standard has not been met; or

(c) A situation in which observations or data collected demonstrate noncompliance with an emission limitation or standard or any work practice or operating condition required by the permit.

3. The permittee shall promptly report to the EPA Regional Office any deviations from permit requirements, including those attributable to upset conditions as defined in this permit, the probable cause of such deviations, and any corrective actions or preventive measures taken. "Prompt" is defined as follows:

(a) Any definition of "prompt" or a specific timeframe for reporting deviations provided in an underlying applicable requirement as identified in this permit; or

(b) Where the underlying applicable requirement fails to address the time frame for reporting deviations, reports of deviations will be submitted based on the following schedule:

(i) For emissions of a hazardous air pollutant or a toxic air pollutant (as identified in the applicable regulation) that continue for more than an hour in excess of permit requirements, the report shall be made within 24 hours of the occurrence;
(ii) For emissions of any regulated air pollutant, excluding a hazardous air pollutant or a toxic air pollutant that continue for more than two (2) hours in excess of permit requirements, the report shall be made within 48 hours; and
(iii) For all other deviations from permit requirements, the report shall be submitted with the semi-annual monitoring.

(c) If either of the conditions in (i) and (ii) above is met, the source shall notify EPA by telephone (1-800-227-8917) or facsimile (303-312-6064) based on the timetables listed above. *[Explanatory note: Notification by telephone or facsimile must specify that this notification is a deviation report for a part 71 permit.* A written notice, certified consistent with the requirements of this permit must be submitted within ten (10) working days of the occurrence. All deviations reported under this section must also be identified in the 6-month report.

*[Explanatory Note: To help part 71 permittees meet reporting responsibilities, EPA has developed a form "PDR" for prompt deviation reporting. The form may be found on the EPA website at: http://www.epa.gov/air/oaqps/permits/p71forms.html.]*

**VI.C. Permit Shield** [40 CFR 71.6(f)(3)]

1. Nothing in this permit shall alter or affect the following:

(a) The liability of a permittee for any violation of applicable requirements prior to or at the time of permit issuance;

(b) The ability of the EPA to obtain information under Section 114 of the CAA; or

(c) The provisions of Section 303 of the CAA (emergency orders), including the authority of the Administrator under that section.

[40 CFR 71.6(f)(3)]

## VII. Part 71 Administrative Requirements

**VII.A. Annual Fee Payment** [40 CFR 71.6(a)(7) and 40 CFR 71.9]

1. The permittee shall pay an annual permit fee in accordance with the procedures outlined below.

[40 CFR 71.9(a)]

2. The permittee shall pay the annual permit fee each year no later than April 1. The annual fee shall be based on the previous calendar year (January 1 – December 31).

[40 CFR 71.9(h)]

3. The fee payment shall be in United States currency and shall be paid by money order, bank draft, certified check, corporate check, or electronic funds transfer payable to the order of the U.S. Environmental Protection Agency.

[40 CFR 71.9(k)(1)]

4. The permittee shall send fee payment and a completed fee filing form to:

| **For regular U.S. Postal Service mail** | **For non-U.S. Postal Service express mail** (FedEx, Airborne, DHL, and UPS) |
|---|---|
| U.S. Environmental Protection Agency<br>FOIA and Miscellaneous Payments<br>Cincinnati Finance Center<br>P.O. Box 979078<br>St. Louis, MO 63197-9000 | U.S. Bank<br>Government Lockbox 979078<br>U.S. EPA FOIA & Misc. Payments<br>1005 Convention Plaza<br>SL-MO-C2-GL<br>St. Louis, MO 63101 |

[40 CFR 71.9(k)(2)]

5. The permittee shall send an updated fee calculation worksheet form and a photocopy of each fee payment check (or other confirmation of actual fee paid) submitted annually by the same deadline as required for fee payment.

[40 CFR 71.9(h)(1)]

*[Explanatory note: The fee filing form "FF" and the fee calculation worksheet form "FEE" may be found on EPA website at: http://www.epa.gov/air/oaqps/permits/p71forms.html]*

6. Basis for calculating annual fee:

(a) The annual emissions fee shall be calculated by multiplying the total tons of actual emissions of all "regulated pollutants (for fee calculation)" emitted from the source by the presumptive emissions fee (in dollars/ton) in effect at the time of calculation.

[40 CFR 71.9(c)(1)]

(i) "Actual emissions" means the actual rate of emissions in tpy of any regulated pollutant (for fee calculation) emitted from a part 71 source over the preceding calendar year. Actual emissions shall be calculated using each emissions units actual operating hours, production rates, in-place control equipment, and types of materials processed, stored, or combusted during the preceding calendar year.

[40 CFR 71.9(c)(6)]

(ii) Actual emissions shall be computed using methods required by the permit for determining compliance, such as monitoring or source testing data.

[40 CFR 71.9(h)(3)]

(iii) If actual emissions cannot be determined using the compliance methods in the permit, the permittee shall use other federally recognized procedures.

[40 CFR 71.9(e)(2)]

*[Explanatory note: The presumptive fee amount is revised each calendar year to account for inflation, and it is available from EPA prior to the start of each calendar year.]*

(b) The permittee shall exclude the following emissions from the calculation of fees:

(i) The amount of actual emissions of each regulated pollutant (for fee calculation) that the source emits in excess of 4,000 tons per year (tpy);

[40 CFR 71.9(c)(5)(i)]

(ii) Actual emissions of any regulated pollutant (for fee calculation) already included in the fee calculation; and

[40 CFR 71.9(c)(5)(ii)]

(iii) The quantity of actual emissions (for fee calculation) of insignificant activities [defined in §71.5(c)(11)(i)] or of insignificant emissions levels from emissions units identified in the permittee's application pursuant to §71.5(c)(11)(ii).

[40 CFR 71.9(c)(5)(iii)]

7. Fee calculation worksheets shall be certified as to truth, accuracy, and completeness by a responsible official.

[40 CFR 71.9(h)(2)]

*[Explanatory note: The fee calculation worksheet form already incorporates a section to help you meet this responsibility.]*

8. The permittee shall retain fee calculation worksheets and other emissions-related data used to determine fee payment for 5 years following submittal of fee payment. *[Emission-related data include, for example, emissions-related forms provided by EPA and used by the permittee for fee calculation purposes, emissions-related spreadsheets, and emissions-related data, such as records of emissions monitoring data and related support information required to be kept in accordance with §71.6(a)(3)(ii).]*

[40 CFR 71.9(i)]

9. Failure of the permittee to pay fees in a timely manner shall subject the permittee to assessment of penalties and interest in accordance with §71.9(l).

[40 CFR 71.9(l)]

10. When notified by EPA of underpayment of fees, the permittee shall remit full payment within 30 days of receipt of notification.

[40 CFR 71.9(j)(2)]

11. A permittee who thinks an EPA assessed fee is in error and who wishes to challenge such fee, shall provide a written explanation of the alleged error to EPA along with full payment of the EPA assessed fee.

[40 CFR 71.9(j)(3)]

**VII.B. Annual Emissions Inventory** [40 CFR 71.9(h)(1)and (2)]

The permittee shall submit an annual emissions report of its actual emissions for both criteria pollutants and regulated HAPs for this facility for the preceding calendar year for fee assessment purposes. The annual emissions report shall be certified by a responsible official and shall be submitted each year to EPA by April 1st.

*[Explanatory note: An annual emissions report, required at the same time as the fee calculation worksheet by §71.9(h), has been incorporated into the fee calculation worksheet form as a convenience.]*

**VII.C. Compliance Requirements**

1. Compliance with the Permit

   (a) The permittee must comply with all conditions of this part 71 permit. Any permit noncompliance constitutes a violation of the CAA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

   [40 CFR 71.6(a)(6)(i)]

(b) It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

[40 CFR 71.6(a)(6)(ii)]

(c) For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any requirement of this permit, nothing shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

[Section 113(a) and 113(e)(1) of the Act, 40 CFR 51.212, 52.12, 52.33, 60.11(g), and 61.12]

2. Compliance Schedule

(a) For applicable requirements with which the source is in compliance, the source will continue to comply with such requirements.

[40 CFR 71.5(c)(8)(iii)(A)]

(b) For applicable requirements that will become effective during the permit term, the source shall meet such requirements on a timely basis.

[40 CFR 71.5(c)(8)(iii)(B)]

3. Compliance Certifications

(a) The permittee shall submit to EPA a certification of compliance with permit terms and conditions, including emission limitations, standards, or work practices annually on April 1st. The certification of compliance shall cover the previous calendar year.

[40 CFR 71.6(c)(5)]

(b) The compliance certification shall be certified as to truth, accuracy, and completeness by a responsible official consistent with §71.5(d).

[40 CFR 71.6(c)(5)]

(c) The certification shall include the following:

(i) Identification of each permit term or condition that is the basis of the certification;

(ii) The identification of the method(s) or other means used for determining the compliance status of each term and condition during the certification period, and whether such methods or other means provide continuous or intermittent data. Such methods and other means shall include, at a minimum, the methods and means required in this permit. If necessary, the permittee also shall identify any other material information that must be included in the certification to comply with Section 113(c)(2) of the CAA, which prohibits knowingly making a false certification or omitting material information;

(iii) The status of compliance with each term and condition of the permit for the period covered by the certification shall be based on the method or means designated above. The certification shall identify each deviation and take it into account in the compliance certification;

(iv) Such other facts as the EPA may require to determine the compliance status of the source; and

(v) Whether compliance with each permit term was continuous or intermittent.

[40 CFR 71.6(c)(5)(iii)]

*[Explanatory note: To help part 71 permittees meet reporting responsibilities, EPA has developed a reporting form for annual compliance certifications. The form may be found on EPA website at: http://www.epa.gov/air/oaqps/permits/p71forms.html]*

**VII.D. Duty to Provide and Supplement Information**
[40 CFR 71.6(a)(6)(v), 71.5(a)(3), and 71.5(b)]

1. The permittee shall furnish to EPA, within a reasonable time, any information that EPA may request in writing to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with the permit. Upon request, the permittee shall also furnish to the EPA copies of records that are required to be kept pursuant to the terms of the permit, including information claimed to be confidential. Information claimed to be confidential must be accompanied by a claim of confidentiality according to the provisions of 40 CFR part 2, subpart B.

[40 CFR 71.6(a)(6)(v) and 40 CFR 71.5(a)(3)]

2. The permittee, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the permit application, shall promptly submit such supplementary facts or corrected information. In addition, a permittee shall provide additional information as necessary to address any requirements that become applicable after the date a complete application is filed, but prior to release of a draft permit.

[40 CFR 71.5(b)]

**VII.E. Submissions** [40 CFR 71.5(d), 71.6(c)(1) and 71.9(h)(2)]

1. Any document (application form, report, compliance certification, etc.) required to be submitted under this permit shall be certified by a responsible official as to truth, accuracy, and completeness. Such certifications shall state that based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

*[Explanatory note: EPA has developed a reporting form "CTAC" for certifying truth, accuracy and completeness of part 71 submissions. The form may be found on EPA website at: http://www.epa.gov/air/oaqps/permits/p71forms.html]*

2. Any documents required to be submitted under this permit, including reports, test data, monitoring data, notifications, compliance certifications, fee calculation worksheets, and applications for renewals and permit modifications shall be submitted to:

Part 71 Permit Contact
Air Program, 8P-AR
U.S. Environmental Protection Agency,
1595 Wynkoop Street
Denver, Colorado 80202-1129

**VII.F. Severability Clause** [40 CFR 71.6(a)(5)]

The provisions of this permit are severable, and in the event of any challenge to any portion of this permit, or if any portion is held invalid, the remaining permit conditions shall remain valid and in force.

**VII.G. Permit Actions** [40 CFR 71.6(a)(6)(iii)]

This permit may be modified, revoked, reopened, and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

**VII.H. Administrative Permit Amendments** [40 CFR 71.7(d)]

1. The permittee may request the use of administrative permit amendment procedures for a permit revision that:

   (a) Corrects typographical errors;

   (b) Identifies a change in the name, address, or phone number of any person identified in the permit, or provides a similar minor administrative change at the source;

   (c) Requires more frequent monitoring or reporting by the permittee;

   (d) Allows for a change in ownership or operational control of a source where the EPA determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee has been submitted to the EPA;

   (e) Incorporates into the part 71 permit the requirements from preconstruction review permits authorized under an EPA-approved program, provided that such a program meets procedural requirements substantially equivalent to the requirements of §§71.7 and 71.8 that would be applicable to the change if it were subject to review as a permit modification, and compliance requirements substantially equivalent to those contained in §71.6; or

   (f) Incorporates any other type of change which EPA has determined to be similar to those listed above in subparagraphs (a) through (e) above.

*[Explanatory note: If subparagraphs (a) through (e) above do not apply, please contact EPA for a determination of similarity prior to submitting your request for an administrative permit amendment under this provision.]*

**VII.I. Minor Permit Modifications** [40 CFR 71.7(e)(1)]

1. The permittee may request the use of minor permit modification procedures only for those modifications that:

   (a) Do not violate any applicable requirement;

   (b) Do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

   (c) Do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis;

   (d) Do not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include:

      (i) A federally enforceable emissions cap assumed to avoid classification as a modification under any provision of title I; and
      (ii) An alternative emissions limit approved pursuant to regulations promulgated under Section 112(i)(5) of the CAA;

   (e) Are not modifications under any provision of title I of the CAA; and

   (f) Are not required to be processed as a significant modification.

   [40 CFR 71.7(e)(1)(i)(A)]

2. Notwithstanding the list of changes ineligible for minor permit modification procedures above, minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in an applicable implementation plan or in applicable requirements promulgated by EPA.

   [40 CFR 71.7(e)(1)(i)(B)]

3. An application requesting the use of minor permit modification procedures shall meet the requirements of §71.5(c) and shall include the following:

   (a) A description of the change, the emissions resulting from the change, and any new applicable requirements that will apply if the change occurs;

   (b) The source's suggested draft permit;

(c) Certification by a responsible official, consistent with §71.5(d), that the proposed modification meets the criteria for use of minor permit modification procedures and a request that such procedures be used; and

(d) Completed forms for the permitting authority to use to notify affected States as required under §71.8.

[40 CFR 71.7(e)(1)(ii)]

4. The source may make the change proposed in its minor permit modification application immediately after it files such application. After the source makes the change allowed by the preceding sentence, and until the permitting authority takes any of the actions authorized by §71.7(e)(1)(iv)(A) through (C), the source must comply with both the applicable requirements governing the change and the proposed permit terms and conditions. During this time period, the source need not comply with the existing permit terms and conditions it seeks to modify. However, if the source fails to comply with its proposed permit terms and conditions during this time period, the existing permit terms and conditions it seeks to modify may be enforced against it.

[40 CFR 71.7(e)(1)(v)]

5. The permit shield under §71.6(f) may not extend to minor permit modifications.

[40 CFR 71.7(e)(1)(vi)]

**VII.J. Group Processing of Minor Permit Modifications**. [40 CFR 71.7(e)(2)]

1. Group processing of modifications by EPA may be used only for those permit modifications:

(a) That meet the criteria for minor permit modification procedures under this permit; and

(b) That collectively are below the threshold level of 10 percent of the emissions allowed by the permit for the emissions unit for which the change is requested, 20 percent of the applicable definition of major source in §71.2, or 5 tpy per year, whichever is least.

[40 CFR 71.7(e)(2)(i)]

2. An application requesting the use of group processing procedures shall be submitted to EPA, shall meet the requirements of §71.5(c), and shall include the following:

(a) A description of the change, the emissions resulting from the change, and any new applicable requirements that will apply if the change occurs;

(b) The source's suggested draft permit;

(c) Certification by a responsible official, consistent with §71.5(d), that the proposed modification meets the criteria for use of group processing procedures and a request that such procedures be used;

(d) A list of the source's other pending applications awaiting group processing, and a determination of whether the requested modification, aggregated with these other applications, equals or exceeds the threshold set under the subparagraph above; and

(e) Completed forms for the permitting authority to use to notify affected States as required under §71.8.

[40 CFR 71.7(e)(2)(ii)]

3. The source may make the change proposed in its minor permit modification application immediately after it files such application. After the source makes the change allowed by the preceding sentence, and until the permitting authority takes any of the actions authorized by §71.7(e)(1)(iv)(A) through (C), the source must comply with both the applicable requirements governing the change and the proposed permit terms and conditions. During this time period, the source need not comply with the existing permit terms and conditions it seeks to modify. However, if the source fails to comply with its proposed permit terms and conditions during this time period, the existing permit terms and conditions it seeks to modify may be enforced against it.

[40 CFR 71.7(e)(2)(v)]

4. The permit shield under §71.6(f) may not extend to group processing of minor permit modifications.

[40 CFR 71.7(e)(2)(vi)]

**VII.K. Significant Permit Modifications** [40 CFR 71.7(e)(3)]

1. The permittee must request the use of significant permit modification procedures for those modifications that:

(a) Do not qualify as minor permit modifications or as administrative amendments;

(b) Are significant changes in existing monitoring permit terms or conditions; or

(c) Are relaxations of reporting or recordkeeping permit terms or conditions.

[40 CFR 71.7(e)(3)(i)]

2. Nothing herein shall be construed to preclude the permittee from making changes consistent with part 71 that would render existing permit compliance terms and conditions irrelevant.

[40 CFR 71.7(e)(3)(i)]

3. Permittees must meet all requirements of part 71 for applications, public participation, and review by affected states and tribes for significant permit modifications. For the application to be determined complete, the permittee must supply all information that is required by §71.5(c) for permit issuance and renewal, but only that information that is related to the proposed change.

[40 CFR 71.7(e)(3)(ii), 71.8(d), and 71.5(a)(2)]

**VII.L. Reopening for Cause** [40 CFR 71.7(f)]

1. The permit may be reopened and revised prior to expiration under any of the following circumstances:

   (a) Additional applicable requirements under the Act become applicable to a major part 71 source with a remaining permit term of 3 or more years. Such a reopening shall be completed no later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions have been extended pursuant to §71.7(c)(3);

   (b) Additional requirements (including excess emissions requirements) become applicable to an affected source under the acid rain program. Upon approval by the Administrator, excess emissions offset plans shall be deemed to be incorporated into the permit;

   (c) EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit; or

   (d) EPA determines that the permit must be revised or revoked to assure compliance with the applicable requirements.

**VII.M. Property Rights** [40 CFR 71.6(a)(6)(iv)]

This permit does not convey any property rights of any sort, or any exclusive privilege.

**VII.N. Inspection and Entry** [40 CFR 71.6(c)(2)]

Upon presentation of credentials and other documents as may be required by law, the permittee shall allow EPA or an authorized representative to perform the following:

1. Enter upon the permittee's premises where a part 71 source is located or emissions-related activity is conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and

4. As authorized by the CAA, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit or applicable requirements.

**VII.O. Emergency Provisions** [40 CFR 71.6(g)]

1. In addition to any emergency or upset provision contained in any applicable requirement, the permittee may seek to establish that noncompliance with a technology-based emission limitation under this permit was due to an emergency. To do so, the permittee shall

demonstrate the affirmative defense of emergency through properly signed, contemporaneous operating logs, or other relevant evidence that:

(a) An emergency occurred and that the permittee can identify the cause(s) of the emergency;

(b) The permitted facility was at the time being properly operated;

(c) During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards, or other requirements in this permit; and

(d) The permittee submitted notice of the emergency to EPA within 2 working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken. This notice fulfills the requirements for prompt notification of deviations.

2. In any enforcement preceding the permittee attempting to establish the occurrence of an emergency has the burden of proof.

3. An "emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the source, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventive maintenance, careless or improper operation, or operator error.

**VII.P. Transfer of Ownership or Operation** [40 CFR 71.7(d)(1)(iv)]

A change in ownership or operational control of this facility may be treated as an administrative permit amendment if the EPA determines no other change in this permit is necessary and provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee has been submitted to EPA.

**VII.Q. Off Permit Changes** [40 CFR 71.6(a)(12) and 40 CFR 71.6(a)(3)(ii)]

The permittee is allowed to make certain changes without a permit revision, provided that the following requirements are met:

1. Each change is not addressed or prohibited by this permit;

2. Each change shall meet with all applicable requirements and shall not violate any existing permit term or condition;

3. Changes under this provision may not include changes subject to any requirement of 40 CFR parts 72 through 78 or modifications under any provision of Title I of the CAA;

4. The permittee must provide contemporaneous written notice to EPA of each change, except for changes that qualify as insignificant activities under §71.5(c)(11). The written notice must describe each change, the date of the change, any change in emissions, pollutants emitted, and any applicable requirements that would apply as a result of the change;

5. The permit shield does not apply to changes made under this provision; and

6. The permittee must keep a record describing all changes that result in emissions of any regulated air pollutant subject to any applicable requirement not otherwise regulated under this permit, and the emissions resulting from those changes.

7. The notice shall be kept on site and made available to EPA on request, in accordance with the general recordkeeping provision of this permit.

8. Submittal of the written notice required above shall not constitute a waiver, exemption, or shield from applicability of any applicable standard or PSD permitting requirements under 40 CFR 52.21 that would be triggered by the replacement of any one emission unit, or by replacement of multiple emission units.

**VII.R. Permit Expiration and Renewal** [40 CFR 71.5(a)(1)(iii), 71.5(a)(2), 71.5(c)(5), 71.6(a)(11), 71.7(b), 71.7(c)(1), and 71.7(c)(3)]

1. This permit shall expire upon the earlier occurrence of the following events:

   (a) Five (5) years elapse from the date of issuance; or

   (b) The source is issued a part 70 or part 71 permit under an EPA approved or delegated permit program.

   [40 CFR 71.6(a)(11)]

2. Expiration of this permit terminates the permittee's right to operate unless a timely and complete permit renewal application has been submitted at least 6 months but not more than 18 months prior to the date of expiration of this permit.

   [40 CFR 71.5(a)(1)(iii)]

3. If the permittee submits a timely and complete permit application for renewal, consistent with §71.5(a)(2), but EPA has failed to issue or deny the renewal permit, then all the terms and conditions of the permit, including any permit shield granted pursuant to §71.6(f) shall remain in effect until the renewal permit has been issued or denied.

   [40 CFR 71.7(c)(3)]

4. The permittee's failure to have a part 71 permit is not a violation of this part until EPA takes final action on the permit renewal application. This protection shall cease to apply if, subsequent to the completeness determination, the permittee fails to submit any additional information identified as being needed to process the application by the deadline specified in writing by EPA.

   [40 CFR 71.7(b)]

5. Renewal of this permit is subject to the same procedural requirements that apply to initial permit issuance, including those for public participation, affected State, and tribal review.

[40 CFR 71.7(c)(1)]

6. The application for renewal shall include the current permit number, description of permit revisions and off permit changes that occurred during the permit term, any applicable requirements that were promulgated and not incorporated into the permit during the permit term, and other information required by the application form.

[40 CFR 71.5(a)(2) and 71.5(c)(5)]

# VIII. Appendix

## VIII.A. Inspection Information

1. Driving Directions:

   To get to the Tekoi Landfill:

   - Take Exit #77 (State Rd 196 exit) off Interstate 80;
   - Proceed south on State Rd 196 for 28 miles;
   - Landfill is located on the east side of the road.

2. Global Positioning System (GPS):

   Latitude: 40.358323 N
   Longitude: 112.724416 W

3. Safety Considerations:

   A site visit requires steel toe boots, hard hat, and safety glasses.

# Appendix B

## Part 71 Permit Application Forms

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 06/30/2015
(Approval extended during OMB review)

Federal Operating Permit Program (40 CFR Part 71)

# GENERAL INFORMATION AND SUMMARY (GIS)

## A. Mailing Address and Contact Information

Facility name _Tekoi Landfill_____

Mailing address: Street or P.O. Box __6976 West California Avenue_____

City _Salt Lake City_____ State _UT_____ ZIP __84104____-_____

Contact person: _Brad Kloos_____ Title __Senior District Manager_____

Telephone (801) 605 - 1954_____ Ext. _____

Facsimile (_____) _____ - _____

## B. Facility Location

Temporary source? ___Yes _X__No Plant site location _

Section 18, Township, 5, Range West (Skull Valley Band of Goshute Indians Community)

City Skull Valley Band of Ghoshute Indian Reservation State_UT County_Tooele EPA Region_8__

Is the facility located within:

Indian lands? _X__YES ___ NO An offshore source in federal waters? ___YES __X_ NO

Non-attainment area? ___ YES _X__NO If yes, for what air pollutants? _____

Within 50 miles of affected State? __ YES _X_ NO If yes, What State(s)? _____

## C. Owner

Name Skull Valley Band of Ghoshute Indians Street/P.O. Box _1198 North Main Street_____

City _Tooele_____ State_UT___ ZIP_8404_____

Telephone (435__) _882__ - _4532_____ Ext_____

## D. Operator

Name _Waste Management of Utah, Inc._ Street/P.O. Box _2433 S 2050 W_____

City ___West Haven_____ State __UT____ ZIP __84401_____

Telephone (801) 605 - 1954_____ Ext_____

**E. Application Type**

Mark only one permit application type and answer the supplementary question appropriate for the type marked.

___Initial Permit __X_ Renewal ___ Significant Mod ___ Minor Permit Mod(MPM)

___ Group Processing, MPM ___ Administrative Amendment

For initial permits, when did operations commence? _____ /_____ /_____

For permit renewal, what is the expiration date of current permit? __09__/_22___/__16___

**F. Applicable Requirement Summary**

Mark the types of applicable requirements that apply:

__X_ SIP ___ FIP/TIP ___ PSD ___Non-attainment NSR

___ Minor source NSR _X__ Section 111 ___ Phase I acid rain ___Phase II acid rain

_X__ Stratospheric ozone ___ OCS regulations _X__ NESHAP ___ Sec. 112(d) MACT

___ Sec. 112(g) MACT ___ Early reduction of HAP ___ Sec 112(j) MACT ___ RMP [Sec.112(r)]

___ Section 129 ___ NAAQS, increments or visibility but for temporary sources (This is rare)

Is the source subject to the Deepwater Port Act? ___YES _X__NO

Has a risk management plan been registered? ___YES _X__NO Agency _____

Phase II acid rain application submitted? ___YES _X__NO If YES, Permitting Authority _____

**G. Source-Wide PTE Restrictions and Generic Applicable Requirements**

Cite and describe any emissions-limiting requirements and/or facility-wide "generic" applicable requirements.

| |
|---|
| 40 CFR 60.752(A) – Requires landfill owner/operator to install a gas collection system when the NMOC emission rate exceeds 50 Mg per year |
| Please see attached Title V permit for other applicable requirements. |
| |
| |
| |

**H. Process Description**

List processes, products, and SIC codes for the facility.

| Process | Products | SIC |
|---|---|---|
| Waste disposal | None | 4953 |
| | | |
| | | |
| | | |

**I. Emission Unit Identification**

Assign an emissions unit ID and describe each emissions unit at the facility. Control equipment and/or alternative operating scenarios associated with emissions units should by listed on a separate line. Applicants may exclude from this list any insignificant emissions units or activities.

| Emissions Unit ID | Description of Unit |
|---|---|
| E1 | Fugitve NMOC and VOC emissions from MSW landfill: 45 million meters design capacity |
| E2 | Fugitive dust emissions from paved roads, unpaved roads, and material handling |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

**J. Facility Emissions Summary**

Enter potential to emit (PTE) for the facility as a whole for each regulated air pollutant listed below. Enter the name of the single HAP emitted in the greatest amount and its PTE. For all pollutants, stipulations to major source status may be indicated by entering "major" in the space for PTE. Indicate the total actual emissions for fee purposes for the facility in the space provided. Applications for permit modifications need not include actual emissions information.

NOx ___0.0___ tons/yr VOC ___94.1_____ tons/yr SO2 __0.0_____ tons/yr

PM-10 __0.0___ tons/yr CO __0.0_____ tons/yr Lead ___0.0_____ tons/yr

Total HAP __4.9____ tons/yr

Single HAP with greatest amount ___Toluene_____ PTE __1.64__ tons/yr

Total of regulated pollutants (for fee calculation), Sec. F, line 5 of form FEE _____ tons/yr

**K. Existing Federally-Enforceable Permits**

Permit number(s) _V-SV-0000-2010.00 Permit type _Title V_ Permitting authority USEPA, Region 8__

Permit number(s) _____ Permit type _____ Permitting authority _____

**L. Emission Unit(s) Covered by General Permits**

Emission unit(s) subject to general permit __NA_____

Check one: ___ Application made ___ Coverage granted

General permit identifier _____ Expiration Date ____/____/____

**M. Cross-referenced Information**

Does this application cross-reference information? __X_ YES ___ NO (If yes, see instructions)

INSTRUCTIONS FOLLOW

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

**EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)**

**A. General Information**

Emissions unit ID: **E1** Description: **Municipal Solid Waste Landfill (MSW)**

SIC Code (4-digit): **4953** SCC Code_____

**B. Emissions Unit Description**

Primary use or equipment type: **MSW and Construction and Demolition Debris Disposal**

Manufacturer **NA** Model No. **NA**

Serial No. **NA** Installation date **01 / 14 / 2005**

Raw materials **NA**

Finished products **NA**

Temporary source: **X** No ___Yes

**C. Activity or Production: Rates Waste Disposal**

| Activity or Production Rate | Amount/Hour | Amount/Year |
|---|---|---|
| Actual Rate | **Not Applicable** | **191,967 tons/year** |
| Maximum rate | **Not Applicable** | **1,248,000 tons/year** |

**D. Associated Air Pollution Control Equipment**

Emissions unit ID: **Not Applicable** Device Type **Not Applicable**

Manufacturer _____ Model No_____

Serial No. _____ Installation date _____/_____/_____

Control efficiency (%) _____.___ Capture efficiency (%) _____.___

Air pollutant(s) controlled _____ Efficiency estimation method _____

**E. Ambient Impact Assessment**

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) **Not Applicable** Inside stack diameter (ft) **Not Applicable**
Stack temp (F) **Not Applicable** Design stack flow rate (ACFM) **Not Applicable**

Actual stack flow rate (ACFM) **Not Applicable** Velocity (ft/sec) **Not Applicable**

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 09/30/2010

Federal Operating Permit Program (40 CFR Part 71)

**EMISSION UNIT DESCRIPTION FOR PROCESS SOURCES (EUD-3)**

**A. General Information**

Emissions unit ID: **E2** Description: **Fugitive Dust Emissions from Paved & Unpaved Roads and Material Handling**

SIC Code (4-digit): **4953** SCC Code_____

**B. Emissions Unit Description**

Primary use or equipment type: **Waste Transfer Trucks, Haul Trucks, Heavy Equipment**

Manufacturer **NA** Model No. **NA**

Serial No. **NA** Installation date **NA**

Raw materials **NA**

Finished products **NA**

Temporary source: **X** No ___Yes

**C. Activity or Production: Rates Waste Disposal**

| Activity or Production Rate | Amount/Hour | Amount/Year |
|---|---|---|
| Actual Rate | **Not Applicable** | **191,967 tons/year** |
| Maximum rate | **Not Applicable** | **1,248,000 tons/year** |

**D. Associated Air Pollution Control Equipment**

Emissions unit ID: **Not Applicable** Device Type **Not Applicable**

Manufacturer _____ Model No_____

Serial No. _____ Installation date _____/_____/_____

Control efficiency (%) _____.___ Capture efficiency (%) _____.___

Air pollutant(s) controlled _____ Efficiency estimation method _____

**E. Ambient Impact Assessment**

This information must be completed by temporary sources or when ambient impact assessment is an applicable requirement for this emissions unit (This is not common)).

Stack height (ft) **Not Applicable** Inside stack diameter (ft) **Not Applicable**
Stack temp (F) **Not Applicable** Design stack flow rate (ACFM) **Not Applicable**

Actual stack flow rate (ACFM) **Not Applicable** Velocity (ft/sec) **Not Applicable**

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 06/30/2015
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Federal Operating Permit Program (40 CFR Part 71)

**EMISSION CALCULATIONS (EMISS)**

Calculate potential to emit (PTE) for applicability purposes and actual emissions for fee purposes for each emissions unit, control device, or alternative operating scenario identified in section I of form **GIS**. If form **FEE** does not need to be submitted with the application, do not calculate actual emissions.

**A. Emissions Unit ID** E1 and E2

**B. Identification and Quantification of Emissions**

For each emissions unit identified above, list each regulated air pollutant or other pollutant for which the source is major, then list any other regulated pollutant (for fee calculation) not already listed. HAP may be simply listed as "HAP." Next, calculate PTE for applicability purposes and actual emissions for fee purposes for each pollutant. Do not calculate PTE for air pollutants listed solely for fee purposes. Include all fugitives for fee purposes. See instructions concerning GHGs. Values should be reported to the nearest tenth (0.1) of a ton for yearly values or tenth (0.1) of a pound for hourly values.

| Air Pollutants | Emission Rates | | | CAS No. |
|---|---|---|---|---|
| | Actual Annual Emissions (tons/yr) | Potential to Emit | | |
| | | Hourly (lb/hr) | Annual (tons/yr) | |
| VOC (E1) | | 21.5 | 94.1 | |
| NMOC (E1) | | 55.1 | 241.4 | |
| Total HAP (E1) | | 1.1 | 4.93 | |
| | | | | |
| PM10 (E2) | | 0.0 | 0.0 | |
| | | | | |
| | | | | |

Notes:

Only GHG Fee Adjustment is associated with this application (see form FEE in Appendix B).

Therefore, no actual emissions are included on this form.

Potential to Emit emissions are regulated emissions only (fugitive emissions not included).

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(Approval extended during OMB review)

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## POTENTIAL TO EMIT (PTE)

For each emissions unit at the facility, list the unit ID and the PTE of each air pollutant listed below and sum the values to determine the total PTE for the facility. It may be helpful to complete form **EMISS** before completing this form. Report each pollutant at each unit to the nearest tenth (0.1) of a ton; values may be reported with greater precision (i.e., more decimal places) if desired. Report facility total PTE for each listed pollutant on this form and in section **J** of form **GIS**. The HAP column is for the PTE of all HAPs for each unit. You may use an attachment to show any pollutants that may be present in major amounts that are not already listed on the form (this is not common).

| Emissions Unit ID | Regulated Air Pollutants and Pollutants for which Source is Major (PTE in tons/yr) | | | | | | |
|---|---|---|---|---|---|---|---|
| | NOx | VOC | SO2 | PM10 | CO | Lead | HAP |
| E1 | 0.0 | 94.1 | 0.0 | 241.4 | 0.0 | 0.0 | 4.9 |
| E2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| **FACILITY TOTALS:** | | **201** | | **209** | | | **10.5** |

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 06/30/2015
(Approval extended during OMB review)

Federal Operating Permit Program (40 CFR Part 71)

**INITIAL COMPLIANCE PLAN AND COMPLIANCE CERTIFICATION (I-COMP)**

**SECTION A - COMPLIANCE STATUS AND COMPLIANCE PLAN**

Complete this section for each unique combination of applicable requirements and emissions units at the facility. List all compliance methods (monitoring, recordkeeping and reporting) you used to determine compliance with the applicable requirement described above. Indicate your compliance status at this time for this requirement and compliance methods and check "YES" or "NO" to the follow-up question.

Emission Unit ID(s): E1, E2 (Insignificant Emissions: IE1, IE2, IE3, IE4, stockpiles, leachate storage)

Applicable Requirement (Describe and Cite)

**Please see:**

**March 2015 Annual Compliance Certification for all Emission Units listed on current Title V Permit (Attachment G)**

**September 2015 Six-Month Monitoring Report for all Emission Units listed on current Title V Permit (Attachment H)**

**Note: There are no applicable federally enforceable requirements for insignificant emission units IE4.**

Compliance Methods for the Above (Description and Citation):

Compliance Status:

__X_ In Compliance: Will you continue to comply up to permit issuance? _X__Yes ____No

___ Not In Compliance: Will you be in compliance at permit issuance? ___Yes ___No

___ Future-Effective Requirement: Do you expect to meet this on a timely basis? ____Yes ____No

Emission Unit ID(s): **See above**

Applicable Requirement (Description and Citation):

Compliance Methods for the Above (Description and Citation):

Compliance Status:
___ In Compliance: Will you continue to comply up to permit issuance? ____Yes ____No

___ Not In Compliance: Will you be in compliance at permit issuance? ___Yes ___No

___ Future-Effective Requirement: Do you expect to meet this on a timely basis? ____Yes _____No

## B. SCHEDULE OF COMPLIANCE

Complete this section if you answered "NO" to any of the questions in section A. Also, complete this section if required to submit a schedule of compliance by an applicable requirement. Please attach copies of any judicial consent decrees or administrative orders for this requirement.

Unit(s)_____NA_____ Requirement_____

**Reason for Noncompliance**. Briefly explain reason for noncompliance at time of permit issuance or that future-effective requirement will not be met on a timely basis:

**Narrative Description of how Source Compliance Will be Achieved**. Briefly explain your plan for achieving compliance:

**Schedule of Compliance**. Provide a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance, including a date for final compliance.

| Remedial Measure or Action | Date to be Achieved |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

## C. SCHEDULE FOR SUBMISSION OF PROGRESS REPORTS

Only complete this section if you are required to submit one or more schedules of compliance in section B or if an applicable requirement requires submittal of a progress report. If a schedule of compliance is required, your progress report should start within 6 months of application submittal and subsequently, no less than every six months. One progress report may include information on multiple schedules of compliance.

Contents of Progress Report (describe): NA

First Report____/____/___ Frequency of Submittal_____

Contents of Progress Report (describe):

First Report____/____/___ Frequency of Submittal_____

**D. SCHEDULE FOR SUBMISSION OF COMPLIANCE CERTIFICATIONS**

This section must be completed once by every source. Indicate when you would prefer to submit compliance certifications during the term of your permit (at least once per year).

Frequency of submittal_____annually_____ Beginning__4__/_1___/_17___

**E. COMPLIANCE WITH ENHANCED MONITORING & COMPLIANCE CERTIFICATION REQUIREMENTS**

This section must be completed once by every source. To certify compliance with these, you must be able to certify compliance for every applicable requirement related to monitoring and compliance certification at every unit.

Enhanced Monitoring Requirements: __X__ In Compliance ____ Not In Compliance

Compliance Certification Requirements: __X__ In Compliance ____ Not In Compliance

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**CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)**

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

**A. Responsible Official**

Name: (Last) Bradley (First) Scott (MI) ____

Title Area Vice President

Street or P.O. Box 222 S. Mill Avenue, Suite 333

City Tempe State AZ ZIP 85281 - _____

Telephone (480) 457-4810 Ext. _____ Facsimile (866) 404-8396

**B. Certification of Truth, Accuracy and Completeness** (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) _____

Name (typed) Scott Bradley Date: 3 / 18 / 16

# Appendix C

## Backup Calculations for Emissions Estimates For Insignificant Sources

**TABLE C-1**
**CRITERIA AIR POLLUTANT EMISSIONS FROM INTERNAL COMBUSTION ENGINES**
**TEKOI LANDFILL, UTAH**
**(IE1, IE2, IE3)**

| Unit Description | Fuel Type | Rating (hp) | Maximum | NOx | | | CO | | |
|---|---|---|---|---|---|---|---|---|---|
| **Actual** | | | (hrs/yr) | (g/bhp-hr) | (lb/yr) | (ton/yr) | (g/bhp-hr) | (lb/yr) | (ton/yr) |
| Isuzu (fuel pump engine) [IE1] | Diesel | 89 | 110 | 6.90 | 149 | 0.07 | 3.03 | 65 | 0.03 |
| John Deere (generator engine) [IE2] | Diesel | 165 | 1461 | 5.48 | 2,910 | 1.45 | 0.68 | 359 | 0.18 |
| Subarau-Robin (water pump engine) [IE3] | Diesel | 11 | 100 | 5.48 | 13.28 | 0.01 | 4.05 | 9.82 | 0.00 |
| **PTE** | | | | | | | | | |
| Isuzu (fuel pump engine) [IE1] | Diesel | 89 | 715 | 6.90 | 968 | 0.48 | 3.03 | 425 | 0.21 |
| John Deere (generator engine) [IE2] | Diesel | 165 | 2000 | 5.48 | 3,983 | 1.99 | 0.68 | 491 | 0.25 |
| Honda GX390 (new water pump engine) [IE3] | Gasoline | 13 | 650 | 4.99 | 92.97 | 0.05 | 3.16 | 58.82 | 0.03 |

| Unit Description | Fuel Type | Rating (hp) | Maximum | VOC | | | SOx | | |
|---|---|---|---|---|---|---|---|---|---|
| **Actual** | | | (hrs/yr) | (g/bhp-hr) | (lb/day) | (ton/yr) | (g/bhp-hr) | (lb/day) | (ton/yr) |
| Isuzu (fuel pump engine) [IE1] | Diesel | 89 | 130 | 1.12 | 28.58 | 0.01 | 0.93 | 23.72 | 0.01 |
| John Deere (generator engine) [IE2] | Diesel | 165 | 130 | 0.30 | 14.19 | 0.01 | 0.93 | 43.97 | 0.02 |
| Subarau-Robin (water pump engine) [IE3] | Diesel | 11 | 260 | 0.30 | 1.89 | 0.00 | 0.93 | 5.86 | 0.00 |
| **PTE** | | | | | | | | | |
| Isuzu (fuel pump engine) [IE1] | Diesel | 89 | 715 | 1.12 | 157 | 0.08 | 0.93 | 130 | 0.07 |
| John Deere (generator engine) [IE2] | Diesel | 165 | 3120 | 0.30 | 340 | 0.17 | 0.93 | 1055 | 0.53 |
| Honda GX390 (new water pump engine) [IE3] | Gasoline | 13 | 650 | 6.80 | 127 | 0.06 | 0.27 | 4.99 | 0.002 |

| Unit Description | Fuel Type | Rating (hp) | Maximum | PM | | |
|---|---|---|---|---|---|---|
| **Actual** | | | (hrs/yr) | (g/bhp-hr) | (lb/day) | (ton/yr) |
| Isuzu (fuel pump engine) [IE1] | Diesel | 89 | 130 | 1.00 | 25.45 | 0.01 |
| John Deere (generator engine) [IE2] | Diesel | 165 | 130 | 0.41 | 19.39 | 0.01 |
| Subarau-Robin (water pump engine) [IE3] | Diesel | 11 | 260 | 0.37 | 2.32 | 0.00 |
| **PTE** | | | | | | |
| Isuzu (fuel pump engine) [IE1] | Diesel | 89 | 715 | 1.00 | 140 | 0.07 |
| John Deere (generator engine) [IE2] | Diesel | 165 | 3120 | 0.41 | 465 | 0.23 |
| Honda GX390 (new water pump engine) [IE3] | Gasoline | 13 | 650 | 0.3270 | 6.09 | 0.003 |

**Calculation of Maixmum PTE Emissions:**
Because emissions are directly proportional to refuse accepted, and all other variables remain constant under the PTE conditions, maximum PTE can be calculated by multiplying actual operation hours by the ratio of PTE to actual reefuse tonnages:
1,248,000 tpy/(PTE)/191,967 tpy (actual) = 6.50

3.030048

**Emission Factors**

| | NOx | NOx | CO | CO | VOC | VOC | SOx | SOx | PM | PM | Emission Certification |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hp-hr | g/bhp-hr | lb/hp-hr | g/bhp-hr | lb/hp-hr | g/bhp-hr | lb/hp-hr | g/bhp-hr | lb/hp-hr | g/bhp-hr | |
| Isuzu (fuel pump engine) | | 6.90 | 0.00668 | 3.03 | 0.00247 | 1.12 | 0.00205 | 0.93 | 0.0022 | 1.00 | EPA Certificate of Conformance SZX-NR2-00-31 |
| John Deere (generator engine) | | 5.48 | | 0.68 | | 0.30 | 0.00205 | 0.93 | | 0.41 | EO U-R-004-0119 |
| Honda (old water pump engine) | | 5.48 | | 4.05 | | 0.30 | 0.00205 | 0.93 | | 0.37 | EO U-R-034-0146 |
| Honda GX390 (new water pump engine) | 0.0110 | 4.99 | 0.0070 | 3.16 | 0.0150 | 6.80 | 0.0006 | 0.27 | 0.0007 | 0.33 | |

NOTES:
EO = Executive Order
Criteria pollutant emission factors taken from AP-42, Table 3.3-1, and HAP emission factors taken from AP-42, Table 3.3-2.

**TABLE C-2**
**EMISSION SOURCE ESTIMATES FROM DIESEL FUEL STORAGE AND DISPENSING**
**TEKOI BALEFILL LANDFILL, UTAH**

| **Fuel Amounts** | **VOC Emissions Factor[a] (lb/1000 gal)** | **Amount Dispensed (gal/yr)[b]** | **Total VOC Emissions (tpy)** | **Total VOC Emissions (lb/hr)** |
|---|---|---|---|---|
| Tank Losses | 8.2 | 12,000 | 0.0492 | 1.12E-02 |
| Vapor Control Unit Losses | 5.0 | 12,000 | 0.0300 | 6.84E-03 |
| Total Losses | | | 0.0792 | 0.0181 |
| **HAPs from Diesel Fuel[c]** | **Composition Percent (% of total)** | **Diesel VOC Emissions (tpy)** | **Compound Emissions (tpy)** | **Compound Emissions (lb/hr)** |
| Hexane (Isomers + n-Hexane) | 5.89% | 0.0792 | 4.66E-03 | 1.06E-03 |
| 1,1,2-Trichloroethane | 0.02% | 0.0792 | 1.58E-05 | 3.61E-06 |
| Benzene | 1.58% | 0.0792 | 1.25E-03 | 2.86E-04 |
| Toluene | 2.11% | 0.0792 | 1.67E-03 | 3.81E-04 |
| Ethylbenzene | 0.22% | 0.0792 | 1.74E-04 | 3.98E-05 |
| Xylene (Isomers + o-Xylene) | 1.07% | 0.0792 | 8.47E-04 | 1.93E-04 |
| Cumene | 0.01% | 0.0792 | 7.92E-06 | 1.81E-06 |
| Chlorobenzene | 0.02% | 0.0792 | 1.58E-05 | 3.61E-06 |
| Napthalene | 0.01% | 0.0792 | 7.92E-06 | 1.81E-06 |
| **TOTAL HAPs** | | | 8.66E-03 | 1.98E-03 |

**Notes:**

This emission unit qualifies as an insignificant activity per NAC 445B.288 (f) for storage containers for petroleum liquids having a capacity of less than 40,000 gallons.
The site has one 12,000 gallon diesel fuel underground storage tank (UST), one 500 gallon UST engine oil tank, and a 225-gallon mobile diesel tank.
Emissions from the engine oil tanks and diesel fuel tank are negligible.

(a) Emissions factors (amount of fuel volatilized) are from EPA's FIRE (Factor Information and Retrieval System) database and from AP-42 Section 4-4-5.
(b) Average amount of diesel dispensed provided by the landfill staff, data from year 2007.
(c) Composition percent for volatilized HAPs from diesel are from EPA's SPECIATE database v. 3.1 (Profile #1015).

# TABLE C-3
# FUGITIVE DUST FROM WIND EROSION (Piles)
# TEKOI LANDFILL, UTAH

Aggregate storage piles are typically comprised of nonhomogeneous materials with a portion of nonerodible elements like vegetation and larger particles. Conditions of erosion tend to decay rapidly as erodible materials are carried off leaving a greater percentage of nonerodible materials. The aggregate material surfaces that exist on undisturbed storage piles have finite availability of erodible materials. Disturbing of the pile, as in the case of load-in or load-out, tends to replenish the erodible surface condition. (AP-42, Section 13.2.5, EPA, Jan 1995)

Stockpiles 1, 2 are the only stockpiles at the TBL that are borrowed from regularly. The remaining stockpiles are untouched. Therefore, Stockpiles 1, 2 will be the only stockpiles considered to have active soil areas.

| **Soil Stockpiles** | **Total Area ($ft^2$)*** | **Approximate Active Soil Area ($ft^2$)**** |
|---|---|---|
| Stockpile No 1** | 78,895 | 19,724 |
| Stockpile No 2** | 18,632 | 4,658 |
| Stockpile No 3 | 35,360 | 0 |
| Stockpile No 4 | 55,521 | 0 |
| Stockpile No 5 | 584,780 | 0 |
| **TOTAL ($ft^2$)** | **773,188** | **24,382** |
| **TOTAL (acres)** | **17.75** | **0.56** |
| **Total** | | |

*Areas estimated using AutoCAD 2000 and current topography provided by WM staff.
** Assuming that approximately 25% of the total area is loose at a time.

| | **(a) Current Ave. Area of cover storage (acres)** | **Number of day/yr** | **(b) TSP Emission Factors (lbs/acre/day)** | **PM-10 Emissions (d)** | | | **TSP Emissions (c )** | | | **PM-2.5 Emissions (e)** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **(lb/yr)** | **(lb/day)** | **(tpy)** | **(lb/yr)** | **(lb/day)** | **(ton/yr)** | **(lb/yr)** | **(lb/day)** | **(ton/yr)** |
| Emissions on active days | 0.56 | 260 | 6.3 | 138 | 0.44 | 0.07 | 275 | 1.06 | 0.14 | 14 | 31.20 | 0.01 |
| Emissions during inactive days | 0.56 | 105 | 1.7 | 15.0 | 0.05 | 0.01 | 30.0 | 0.29 | 0.01 | 0.0 | 0.03 | 0.00 |
| **Total Actual Emissions** | | | | **153** | **0.42** | **0.08** | **305** | **0.84** | **0.15** | **14** | **0.04** | **0.01** |
| **Total PTE Emissions (f)** | | | | **991** | **2.72** | **0.50** | **1,983** | **5.43** | **0.99** | **89** | **0.24** | **0.04** |

(a) Current average area of cover storage is estimated from summing all the areas of soil stockpiles on site.
(b) Emissions factors are based on EPA's FIRE (Factor Information and Retrieval System) database.
(c) Equals emissions factors X number of days per year X acres of cover storage.
(d) $PM_{10}$ = (Total Suspended Particulates) x 50% (SJVUAPCD Regulation II, Rule 2201, Section 4.1.1.2).
(e) PM-2.5 emissions factor = Ratio of k value of PM-10 and PM-2.5 from unpaved roads.
(f) Scaling factor based on ratio or maximum potential annual waste tonnage and actual waste tonnage for 2015: 6.5

## TABLE C-4
## LEACHATE COLLECTION SYSTEM EMISSION CALCULATIONS
## TEKOI LANDFILL, UTAH

**VOC Emissions:**

| Sampling Period | Total Volatile Organics[1] | Annual Precipitation[3] | Actual Annual Leachate Generation[4] | Actual Annual Fugitive VOC Emissions[5] | Maximum Landfill Area[2] | Estimated Leachate Production | PTE Annual Leachate Generation | PTE Annual Fugitive VOC Emissions[5] |
|---|---|---|---|---|---|---|---|---|
| | (ug/L) | (inches) | (gal) | (lbs) | (acres) | (gal/acre/day) | (gal) | (lbs) |
| 11/20/2006 | 85.6 | 15.7 | 1,760 | 0.0013 | 353.0 | 100.0 | 12,884,500 | 9.20 |

**HAPs Emissions**

| Compound | Concentration[1] | Average HAP Emissions | | PTE HAP Emissions | |
|---|---|---|---|---|---|
| | (ug/L) | lbs/yr | tons/yr | lbs/yr | tons/yr |
| Acetone | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Acrolein | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Acrylonitrile | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 2-Chloroethyl Vinyl Ether | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Benzene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Bromodichloromethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Bromoform | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Bromomethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 2-Butanone | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Carbon Disulfide | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Carbon Tetrachloride | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Chlorobenzene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Chloroethene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Chloroform | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Chloromethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Dibromochloromethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 1,1-Dichloroethane | 2.6 | 0.000 | 0.000000 | 0.280 | 0.000140 |
| 1,2-Dichloroethane | 22.0 | 0.000 | 0.000000 | 2.365 | 0.001183 |
| 1,1-Dichloroethene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| cis-1,2-Dichloroethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| trans-1,2-Dichloroethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 1,2-Dichlorpropane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| cis-1,3-Dichloropropane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| trans-1,3-Dichlorpropane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Ethylbenzene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 2-Hexanone | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Methylene chloride | 61.0 | 0.001 | 0.000000 | 6.558 | 0.003279 |
| 4-Methyl-2-pentanone | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Styrene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 1,1,2,2-Tetrachloroethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Tetrachlorethylene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Toluene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 1,1,1-Trichloroethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 1,1,2-Trichloroethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Trichloroethane | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| Vinyl Chloride | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| m-,p-Xylene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| 0-Xylene | 0.0 | 0.000 | 0.000000 | 0.000 | 0.000000 |
| **TOTAL** | | **0.00** | **0.000001** | **9.20** | **0.004602** |

**Notes:**

[1] Based on leachate analysis performed on November 20, 2006.
VOC and HAP emission estimates were calculated by using detection limits for compounds listed as non-detect. Those compounds which have no data were not analyzed. The leachate was analyzed by EPA Method 8260B for volatile organics.

[2] Full build-out of the MSW landfill.
percent runoff potential.

[3] Taken from regional rainfall data collected from Western Regional Climatic Center.

[4] Current annual leachate generation as calculated from 2170 milliliters collected over 3 hours during the November 2006 sampling event.

[5] Assuming that 100 percent of volatile organic compounds detected will volatilize.

**Example Calculations:**

Actual Annual Fugitive VOC Emissions (tons) = (Actual Annual Leachate Generation [gal]) * (3.785 L/1gal) * (1g/1,000,000ug) * (Total VOC [ug/l]) * (1lb/453.6g) * (1 ton/2000 lb)

PTE Annual Fugitive VOC Emissions (tons) = (PTE Annual Leachate Generation [gal]) * (3.785 L/1gal) * (1g/1,000,000ug) * (Total VOC [ug/l]) * (1lb/453.6g) * (1 ton/2000 lb)

# Appendix D

# WIAC Report

# Waste Industry Air Coalition
# Comparison of Recent Landfill Gas Analyses with Historic AP-42 Values

by

Ray Huitric, County Sanitation Districts of Los Angeles County
Patrick Sullivan, SCS Engineers
Amy Tinker, SCS Engineers

**January 2001**

## *Summary*

The Waste Industry Air Coalition (WIAC) is comprised of the Solid Waste Association of North America (SWANA) and the National Solid Wastes Management Association. Members of these associations have reported that the AP-42 landfill gas (LFG) defaults, derived from analyses made on average 13 years ago, overestimate the current trace LFG constituent levels.

The WIAC previously submitted three reports addressing LFG trace constituents. An initial report submitted in August 1999[1] showed a continuous long term hazardous air pollutants (HAP) decline at six California landfills (see LFG Constituent Declines below). HAP levels typically declined five fold or more over a ten year period. A second WIAC report was submitted November 1999[2] showing that Hydrogen Chloride levels in recent source tests are more than four times less that the AP-42 default. A third WIAC report was submitted in May 2000[3] showing that the average of recent non-methane organic compound (NMOC) analyses at 144 landfills was 30% less than the current AP-42 defaults.

This fourth report presents a nationwide WIAC survey of recent trace LFG constituent analyses. The WIAC obtained test results from 75 landfills that were made on average within the last two years. The WIAC survey found that the current trace constituent levels are two to four times less than the AP-42 defaults. For the compounds associated with greater health risk at high concentrations, the differences were yet larger. These findings support those from the previous three reports that the AP-42 defaults substantially overstate current LFG constituent levels.

The decline in LFG constituent levels over time may be due to a variety of factors including:

- improvement of analytical methodologies that better identify and quantify trace constituents;
- federal introduction of waste management regulations that strictly regulate hazardous waste disposal;
- federal introduction of municipal solid waste landfill regulations that detect and prevent disposal of unacceptable hazardous wastes; and
- industry transition to processes and products requiring less or no hazardous materials.

In view of the detected decline, it is strongly recommended that the AP-42 defaults be revised to reflect the current LFG constituent levels. From the California landfill results, showing a continuous long term declining trend in the LFG constituents, it can be reasonably anticipated that additional declines will occur. As a result, two further recommendations are offered. First, older AP-42 data should be purged, to eliminate unrepresentative results, and replaced with current data. The most recent AP-42 revision in 1995 only added new but did not purge older values. Second, U.S. EPA should recognize landfills as a unique source for which its AP-42 defaults will need to change over time. U.S. EPA should consider additional future updates of the AP-42 to address the anticipated declines.


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[1] "Documentation of Large MSW Landfill Gas Constituent Declines From US EPA AP-42 Default Values", Ray Huitric, County Sanitation Districts of Los Angeles County, and submitted by John Skinner, Executive Director and CEO, SWANA, on August 30, 1999.

[2] Correspondence titled "Submission of Hydrogen Chloride Test Data from Landfill Gas Fired Combustion Devices" dated November 1999 from Edwin P. Valis, Jr., Project Manager, EMCON to Roy Huntley, Emission Factor and Inventory Group, OAQPS, U.S. Environmental Protection Agency.

[3] Correspondence titled "Preliminary Data on Non-Methane Organic Compound (NMOC) Concentrations in Landfill Gas" dated May 9, 2000 from Edward W. Repa, Director of Environmental Programs, NSWMA to Roy Huntley, Emission Factor and Inventory Group, OAQPS, U.S. Environmental Protection Agency.

The WIAC will provide the analyses it collected to U.S. EPA for use in developing new AP-42 values. Since it is recognized that this process will require time, it is recommended that the U.S. EPA make the results contained in this report available on its Internet site as an interim reference.

## *Report Objectives*

This report documents actual landfill gas concentrations for compounds of concern using a national database derived from laboratory analyses employing U.S. EPA standard methods. Herein we establish that differences between the data presented in this report and the current AP-42 default values warrant their full-scale review by U.S. EPA. WIAC believes that the data presented here far better represent current conditions for many compounds and that such a review is well warranted.

## *Procedures and Results*

AP-42 data management procedures were applied to the portion of the WIAC data set having AP-42 default values. The data management procedures address, for example, data screening, air dilution, and data averaging methods. The results of these procedures follow.

### Data Collection and Screening

WIAC collected LFG analyses from 75 landfills in sixteen states. This information was processed using U.S. EPA's AP-42 data management procedures. U.S. EPA uses a screening process to remove analytically unacceptable, poorly documented or questionable results.[4] A review of the collected data indicated that the sample analyses would likely pass the AP-42 data screening process. The reported samples were normal, untreated LFG derived from typical gas collection systems. The analytical methodologies appeared to be consistent with those accepted by U.S. EPA.

The analytical results were corrected for air dilution using fixed gas analyses (specifically, methane and carbon dioxide). Several samples lacked either or both methane and carbon dioxide and were excluded. Additionally, some results appeared to be default values (e.g., 50% methane and 50% carbon dioxide) or were unusually high; these were excluded as well. In all, analyses from 27 landfills were omitted from subsequent evaluations.

### Data Rating

The data for compounds from the remaining 48 landfills were rated from "A" (strongest) to "E" (weakest) using U.S. EPA's rating system. This process largely depends on the number of 'good' results (A for 20 and up, B for 10 to 19, C for 6 to 9, D for 3 to 5, E for 1 to 2). U.S. EPA also adjusts the rating for a compound's variability. If the arithmetic standard deviation is twice or greater than EPA's default value, then the rating is decreased by one letter. Table 1 summarizes the WIAC rating results and compares these with U.S. EPA's AP-42 data set for 43 compounds.

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[4] "EMISSION FACTOR DOCUMENTATION FOR AP-42 SECTION 2.4 MUNICIPAL SOLID WASTE LANDFILLS REVISED" Office of Air Quality Planning and Standards, Office of Air and Radiation, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, August 1997; see Table 4-1

**Table 1. Count of AP-42 compounds at each rating level (A is strongest; total of 43 compounds).**

| | Count | |
|---|---|---|
| Rating | WIAC | AP-42 |
| A | 12 | 4 |
| B | 14 | 21 |
| C | 2 | 8 |
| D | 6 | 6 |
| E | 9 | 4 |

The overall rating of the WIAC database is essentially the same as that for U.S. EPA's. For example when the letter grade is expressed as a numeric value (e.g., A = 1, B =2, etc.), the average ratings for the WIAC and U.S. EPA data sets are identical.

## Nondetects

AP-42 directs that in general nondetect values should be halved then treated as "real" data. However if a nondetect exceeds by two times the maximum of the detects for a compound, then it should be discarded. It appears that the AP-42 guidance directs that this should be done on a facility-by-facility basis as well as on an emission category basis. However the guidance is unclear. A conservative approach was taken by eliminating only nondetects that were more than double the maximum detection among all facilities.

AP-42 also directs that if all values are nondetects then the result should be clearly indicated as such. U.S. EPA does not indicate which values reported within the LFG portion of AP-42 are nondetects.

## Data Averaging

AP-42 specifies that data from a single landfill are to be arithmetically averaged. The result from each landfill is then further averaged using an arithmetic average, geometric mean, or median depending on whether the landfill data are normally distributed, lognormally distributed, or neither, respectively. The distribution type was determined for each compound using the probability plot correlation coefficient method.[5] Where fewer than four landfills reported a compound, the distribution type could not be determined. Instead, the distribution type originally used by U.S. EPA in AP-42 was employed. The distribution type was found to differ from U.S. EPA's for sixteen compounds.

The WIAC data set was averaged using both U.S. EPA's original and the newer WIAC's distribution types (see Table 2). The original distribution types were applied so that an "apples to apples" comparison was possible. Doing otherwise could either create or obscure differences between the data sets. The averages calculated based on U.S. EPA's and WIAC's averaging types are shown in the WIAC column labeled "1" and "2", respectively. Values in WIAC column 2 having a different distribution type are highlighted in gray. The results using the two data averaging methods are discussed in Data Summary below.

## Codisposal Landfills

Because of detected statistical differences, EPA developed separate codisposal and municipal solid waste (MSW) only default AP-42 levels for toluene and benzene. All other default values

[5] This test was developed by J.J. Filliben in 1975 as reported in "Statistical Training Course for Ground-Water Monitoring Data Analysis", sponsored by the U.S. Environmental Protection Agency Office of Solid Waste, 1992.

were developed from the combined data sets. WIAC surveyed five codisposal sites and 70 MSW-only sites. The WIAC toluene and benzene data were separately analyzed by disposal site type. No significant differences were found between types of disposal sites for other compounds with one exception. Carbon tetrachloride was detected at one codisposal site but at none of the MSW-only disposal sites. The WIAC value for carbon tetrachloride includes the codisposal sites as these had only a slight effect on the calculated value. The value is reported in Table 2 as a 'nondetect' with a footnote indicating that it was found at one codisposal site.

### Data Summary

The WIAC results are compared with AP-42 default concentrations in Table 2. WIAC 1 and 2 show the data prepared using past AP-42 and WIAC updated averaging methods, respectively (see Data Averaging above). The WIAC 1 and 2 concentrations are similarly reduced from AP-42 values by 76% and 80%, respectively. However simple alkane and alcohol compounds for which relatively few analyses were available disproportionately skewed the results. Omitting these compounds shows identical 56% overall reductions. Nearly identical reductions are also noted for aromatic (58%) and chlorinated (79%) compounds. Even though the AP-42 and WIAC averaging methods do not have any large overall effect, the two methods did lead to very significant differences for individual compounds (e.g., note those for 1,1,2,2-Tetrachloroethane).

## *Discussion*

### AP-42 and WIAC Differences

The differences between the AP-42 default values and the WIAC survey results may be traced to various factors. It was noted above that there are differences in the age of analyses between the AP-42 and WIAC data sets. Trends in LFG constituents have been well documented and are addressed in the next section. Apart from differences in the age of analyses, it was found that procedures used in U.S. EPA's preparation of the AP-42 defaults departed from the AP-42 guidance[6] in its use of nondetects and the minimum number of sources used for developing default values.

The guidance specifies that nondetects should be used in the development of default values. However all nondetects were discarded in at least one AP-42 update.[7] Nondetects may be discarded under certain circumstances specified by the guidance where these are much greater in magnitude than detects (doing otherwise would bias the default values high). However, the AP-42 documentation does not identify which values are detects or nondetects making it impossible to implement this procedure. Finally, the guidance states that default values developed entirely from nondetects should be clearly identified as such. Since nondetects are not documented, this procedure cannot be carried out.

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[6] "Procedures for Preparing Emission Factor Documents" Office of Air quality Planning and Standards, Office of Air and Radiation, U.S. Environmental Protection Agency, Research Triangle Park, NC, November 1997 (EPA-454/R-95-015 REVISED).

[7] Phone communication (June 2000) with Stephen Roe, U.S. EPA contractor for past AP-42 revisions.

**Table 2. WIAC results compared with AP-42 defaults. WIAC-1 values use AP-42 averaging methods. Some WIAC-2 values, grayed in column 2, use different methods (see text).**

| Compound | WIAC Sites | Concentration, ppmv AP-42 | WIAC-1 | WIAC-2 |
|---|---|---|---|---|
| 1,1,1-Trichloroethane (methyl chloroform) | 46 | 0.48 | 0.168 | 0.168 |
| 1,1,2,2-Tetrachloroethane | 19 | 1.11 | 0.070 | 0.005 |
| 1,1-Dichloroethane (ethylidene dichloride) | 45 | 2.35 | 0.741 | 0.741 |
| 1,1-Dichloroethene (vinylidene chloride) | 45 | 0.2 | 0.092 | 0.092 |
| 1,2-Dichloroethane (ethylene dichloride) | 47 | 0.41 | 0.120 | 0.120 |
| 1,2-Dichloropropane (propylene dichloride) | 17 | 0.18 | 0.023 | 0.023 |
| 2-Propanol (isopropyl alcohol) | 3 | 50.1 | 7.908 | 7.908 |
| Acetone | 8 | 7.01 | 6.126 | 7.075 |
| Acrylonitrile | 3 | 6.33 | <0.036 | <0.036 |
| Benzene (Co-Disposal) | 3 | 11.1 | 10.376 | 10.376 |
| Benzene (No Co-Disposal) | 44 | 1.91 | 0.972 | 0.972 |
| Bromodichloromethane | 7 | 3.13 | <0.311 | <0.264 |
| Carbon disulfide | 31 | 0.58 | 0.320 | 0.221 |
| Carbon tetrachloride | 37 | 0.004 | <0.007* | <0.007* |
| Carbonyl sulfide | 29 | 0.49 | 0.183 | 0.183 |
| Chlorobenzene | 46 | 0.25 | 0.227 | 0.227 |
| Chlorodifluoromethane (Freon 22) | 1 | 1.3 | 0.355 | 0.355 |
| Chloroethane (ethyl chloride) | 21 | 1.25 | 0.239 | 0.448 |
| Chloroform | 45 | 0.03 | 0.021 | 0.010 |
| Chloromethane | 8 | 1.21 | 0.249 | 0.136 |
| Dichlorobenzene | 34 | 0.21 | 1.607 | 1.448 |
| Dichlorodifluoromethane (Freon 12) | 19 | 15.7 | 1.751 | 0.964 |
| Dichloromethane (Methylene Chloride) | 47 | 14.3 | 3.395 | 3.395 |
| Dimethyl sulfide (methyl sulfide) | 34 | 7.82 | 6.809 | 6.809 |
| Ethane | 1 | 889 | 7.943 | 7.943 |
| Ethanol | 4 | 27.2 | 118.618 | 64.425 |
| Ethyl mercaptan (Ethanethiol) | 36 | 2.28 | 1.356 | 0.226 |
| Ethylbenzene | 26 | 4.61 | 6.789 | 6.789 |
| Ethylene dibromide | 30 | 0.001 | <0.046 | <0.005 |
| Fluorotrichloromethane (Freon 11) | 25 | 0.76 | 0.327 | 0.327 |
| Hexane | 4 | 6.57 | 2.324 | 2.063 |
| Hydrogen sulfide | 40 | 35.5 | 23.578 | 23.578 |
| Methyl ethyl ketone | 8 | 7.09 | 10.557 | 12.694 |
| Methyl isobutyl ketone | 7 | 1.87 | 0.750 | 0.750 |
| Methyl mercaptan | 36 | 2.49 | 1.292 | 1.266 |
| Perchloroethylene (tetrachloroethylene) | 48 | 3.73 | 1.193 | 1.193 |
| Propane | 1 | 11.1 | 14.757 | 19.858 |
| Toluene (Co-Disposal) | 3 | 165 | 37.456 | 37.456 |
| Toluene (No Co-Disposal) | 43 | 39.3 | 25.405 | 25.405 |
| trans-1,2 Dichlorethene | 1 | 2.84 | 0.051 | 0.051 |
| Trichloroethylene (trichloroethene) | 48 | 2.82 | 0.681 | 0.681 |
| Vinyl Chloride | 46 | 7.34 | 1.077 | 1.077 |
| Xylenes | 45 | 12.1 | 16.582 | 16.582 |

Note: "<" indicates that the compound was detected at none of the WIAC sites.

* Carbon Tetrachloride was detected at one codisposal site but at none of 35 MSW-only disposal sites.

The guidance also states that a minimum of ten sources should be used in developing a default value (use of fewer sources results in unreliable values). However several of the AP-42 defaults were developed from many fewer samples and sometimes just one sample. In view of the high variability observed between landfill test results, it is recommended that U.S. EPA carefully review its practices in developing AP-42 defaults with fewer than ten samples. At a minimum, defaults derived from limited data should be clearly identified and users cautioned as to their questionable reliability.

## LFG Constituent Declines

Large, long term declines in LFG HAP values were documented in the August 1999 WIAC report. This report focused on four active and two closed landfills in Southern California. The decline at the active landfills was concurrent with implementation of waste-screening programs that prevented the disposal of incidental amounts of hazardous wastes present in the municipal solid waste stream starting in the early 1980's. U.S. EPA's Resource Conservation and Recovery Act (RCRA) rules for MSW landfills, implemented starting October 9, 1991 (40 CFR 258.20) also began requiring such exclusion programs on a nationwide basis. Additionally, the U.S. EPA established Subtitle C requirements per the 1984 RCRA amendments that set minimum treatment standards for listed wastes. This program ensured that the treatment residuals were placed in Subtitle C landfills. The combination of these programs likely reduced or eliminated incidental hazardous waste disposal in active MSW landfills.

An attempt was made to determine whether a similar long term decline could be detected at other active landfills represented in the AP-42 database. A comparison was made of those sites that were reported by both EPA and WIAC. However it was found that many of the AP-42 landfills had coded names. The only active sites identifiably the same were those already reported in the August 1999 report. It is recommended that U.S. EPA identify the coded AP-42 landfills so that a meaningful comparison could be made with the WIAC results.

The LFG HAP decline for the two closed landfills in the August 1999 report would be unrelated to improved hazardous waste management practices. However the anaerobic decomposition processes at these sites are likely to have brought about such declines through one or more mechanism. HAP compounds will tend to volatilize into newly generated anaerobic gases; the gases together with the trace constituents will ultimately exit the landfill, removing the HAP compounds. Additionally, anaerobic processes may destroy or transform some HAP compounds.

Another factor to consider in the decline of HAP compounds is the effect of improved laboratory methodologies in recent years. Areas of improvement include utilization of more sophisticated equipment and adoption of standardized procedures for all analytical aspects. Some of the improved procedures include sample container preparation, instrument calibration, and quality assurance acceptance criteria.

Equipment and procedure improvements reduce the scatter of data, increase data reliability, minimize compound misidentifications, and lower detection limits. Detection limits are especially important since several of the AP-42 compounds have few or no detections; improved detection limits would tend to lower the calculated AP-42 defaults. One laboratory submitting data for this report indicated that detection limits were more than halved in the last five years.

## Urban Air Toxics Strategy

The U.S. EPA used AP-42 defaults for the recently completed Urban Air Toxics (UAT) Strategy. A review of the UAT findings based on the newer WIAC results is presented in Table 3. For all compounds detected in LFG, municipal landfills dropped in rank among industrial sources. The

drop was typically from sixth to at least thirteenth or more. Four of the nine compounds dropped from the ranking and rank no more than 17th. The average MSW landfill contribution per compound dropped from 13% to 1.5%. One of the more dramatic findings concerns U.S. EPA's original attribution of 84% of all 1,1,2,2-Tetrachloroethane emissions to landfills; the WIAC findings show that the landfill emission level is about 2% of all sources. These findings indicate that municipal landfills have markedly less emissions, compared to other industrial sources, than U.S. EPA previously estimated.

**Table 3. Summary of changes to Urban Air Toxic (UAT) emission estimates based on changes from AP-42 defaults to current compound levels measured by WIAC.**

| | Annual Tons | | Portion of UAT Inventory | | Rank | | Number of |
|---|---|---|---|---|---|---|---|
| Compound | AP-42 | WIAC | AP-42 | WIAC | AP-42 | WIAC | Sources |
| 1,1,2,2-Tetrachloroethane | 216 | 1.0 | 84.08% | 2.37% | 1 | 5 | 16 |
| 1,2-Dichloropropane | 23.6 | 3.0 | 3.59% | 1.48% | 6 | 8 | 12 |
| Acrylonitrile | 389 | 2.2 | 15.28% | 0.10% | 3 | 15 | 17 |
| Benzene | 173 | 87.9 | 3.86% | 2.00% | 11 | 13 | 17 |
| Chloroform | 4.17 | 1.3 | 4.94% | 1.63% | 6 | 9 | 17 |
| Ethylene Dichloride | 47 | 13.7 | 1.15% | 0.34% | 10 | * | 17 |
| Methylene Chloride | 1550 | 367 | 1.67% | 0.40% | 11 | * | 17 |
| Tetrachloroethylene | 717 | 229 | 0.59% | 0.19% | 6 | * | 17 |
| Trichloroethylene | 429 | 104 | 0.64% | 0.16% | 13 | * | 17 |
| Vinyl Chloride | 531 | 77.9 | 19.65% | 3.46% | 2 | 4 | 17 |
| Vinylidene Chloride | 22.5 | 10.3 | 10.10% | 3.45% | 4 | 5 | 14 |

* Landfill emissions are less than for other ranked sources.

## *Conclusions*

WIAC conducted a national survey of recent LFG analyses. Recent results from 75 landfills were analyzed using AP-42 methodologies. The AP-42 defaults were found to typically overestimate current levels by two to four hundred percent. For some of the more health significant compounds, the differences were larger yet. The overestimated AP-42 values may potentially misdirect U.S. EPA's policy development. For example, the recently completed Urban Air Toxics Strategy appears to have substantially overestimated actual landfill emissions. Furthermore, the existing AP-42 default values may adversely impact individual landfills required to use these values.

As a result, WIAC believes that the AP-42 defaults should be revised to reflect the decline in LFG constituents. The most recent AP-42 revision in 1995 added new data to older values and averaged the combined data sets. This approach is appropriate only for data that does not trend. It is recommended that older data be purged and replaced using current data presented in this paper.

# Appendix E

## LandGEM
## Landfill Gas Generation Model Results
## (AP-42 and NSPS)

# AP-42 (Inventory) LandGEM for Current Emissions (2015) Using Tier 2 NMOC Value

# Summary Report

**Landfill Name or Identifier:** Tekoi Landfill, Utah

**Date:** Monday, March 21, 2016

**Description/Comments:**

**About LandGEM:**

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} k L_o \left( \frac{M_i}{10} \right) e^{-k t_{ij}}$$

Where,

$Q_{CH4}$ = annual methane generation in the year of the calculation (*$m^3$/year*)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate (*$year^{-1}$*)
$L_o$ = potential methane generation capacity (*$m^3$/Mg*)

$M_i$ = mass of waste accepted in the $i^{th}$ year (*Mg*)
$t_{ij}$ = age of the $j^{th}$ section of waste mass $M_i$ accepted in the $i^{th}$ year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

## Input Review

LANDFILL CHARACTERISTICS

| | | |
|---|---|---|
| Landfill Open Year | **2005** | |
| Landfill Closure Year (with 80-year limit) | **2052** | |
| *Actual Closure Year (without limit)* | ***2052*** | |
| Have Model Calculate Closure Year? | **Yes** | |
| Waste Design Capacity | **47,939,986** | *short tons* |

MODEL PARAMETERS

| | | |
|---|---|---|
| Methane Generation Rate, k | **0.020** | *year $^{-1}$* |
| Potential Methane Generation Capacity, $L_o$ | **100** | *$m^3$/Mg* |
| NMOC Concentration | **965** | *ppmv as hexane* |
| Methane Content | **50** | *% by volume* |

GASES / POLLUTANTS SELECTED

| | |
|---|---|
| Gas / Pollutant #1: | **Total landfill gas** |
| Gas / Pollutant #2: | **Methane** |
| Gas / Pollutant #3: | **Carbon dioxide** |
| Gas / Pollutant #4: | **NMOC** |

WASTE ACCEPTANCE RATES

| Year | Waste Accepted | | Waste-In-Place | |
|---|---|---|---|---|
| | *(Mg/year)* | *(short tons/year)* | *(Mg)* | *(short tons)* |
| 2005 | 140,242 | 154,266 | 0 | 0 |
| 2006 | 268,131 | 294,944 | 140,242 | 154,266 |
| 2007 | 264,525 | 290,978 | 408,373 | 449,210 |
| 2008 | 192,975 | 212,273 | 672,898 | 740,188 |
| 2009 | 185,518 | 204,070 | 865,874 | 952,461 |
| 2010 | 170,159 | 187,175 | 1,051,392 | 1,156,531 |
| 2011 | 183,426 | 201,769 | 1,221,551 | 1,343,706 |
| 2012 | 172,854 | 190,140 | 1,404,977 | 1,545,475 |
| 2013 | 169,091 | 186,000 | 1,577,832 | 1,735,615 |
| 2014 | 196,194 | 215,814 | 1,746,922 | 1,921,615 |
| 2015 | 174,515 | 191,967 | 1,943,117 | 2,137,428 |
| 2016 | 1,134,545 | 1,248,000 | 2,117,632 | 2,329,395 |
| 2017 | 1,134,545 | 1,248,000 | 3,252,178 | 3,577,395 |
| 2018 | 1,134,545 | 1,248,000 | 4,386,723 | 4,825,395 |
| 2019 | 1,134,545 | 1,248,000 | 5,521,268 | 6,073,395 |
| 2020 | 1,134,545 | 1,248,000 | 6,655,814 | 7,321,395 |
| 2021 | 1,134,545 | 1,248,000 | 7,790,359 | 8,569,395 |
| 2022 | 1,134,545 | 1,248,000 | 8,924,905 | 9,817,395 |
| 2023 | 1,134,545 | 1,248,000 | 10,059,450 | 11,065,395 |
| 2024 | 1,134,545 | 1,248,000 | 11,193,996 | 12,313,395 |
| 2025 | 1,134,545 | 1,248,000 | 12,328,541 | 13,561,395 |
| 2026 | 1,134,545 | 1,248,000 | 13,463,087 | 14,809,395 |
| 2027 | 1,134,545 | 1,248,000 | 14,597,632 | 16,057,395 |
| 2028 | 1,134,545 | 1,248,000 | 15,732,178 | 17,305,395 |
| 2029 | 1,134,545 | 1,248,000 | 16,866,723 | 18,553,395 |
| 2030 | 1,134,545 | 1,248,000 | 18,001,268 | 19,801,395 |
| 2031 | 1,134,545 | 1,248,000 | 19,135,814 | 21,049,395 |
| 2032 | 1,134,545 | 1,248,000 | 20,270,359 | 22,297,395 |
| 2033 | 1,134,545 | 1,248,000 | 21,404,905 | 23,545,395 |
| 2034 | 1,134,545 | 1,248,000 | 22,539,450 | 24,793,395 |
| 2035 | 1,134,545 | 1,248,000 | 23,673,996 | 26,041,395 |
| 2036 | 1,134,545 | 1,248,000 | 24,808,541 | 27,289,395 |
| 2037 | 1,134,545 | 1,248,000 | 25,943,087 | 28,537,395 |
| 2038 | 1,134,545 | 1,248,000 | 27,077,632 | 29,785,395 |
| 2039 | 1,134,545 | 1,248,000 | 28,212,178 | 31,033,395 |
| 2040 | 1,134,545 | 1,248,000 | 29,346,723 | 32,281,395 |
| 2041 | 1,134,545 | 1,248,000 | 30,481,268 | 33,529,395 |
| 2042 | 1,134,545 | 1,248,000 | 31,615,814 | 34,777,395 |
| 2043 | 1,134,545 | 1,248,000 | 32,750,359 | 36,025,395 |
| 2044 | 1,134,545 | 1,248,000 | 33,884,905 | 37,273,395 |

WASTE ACCEPTANCE RATES (Continued)

| Year | Waste Accepted | | Waste-In-Place | |
|---|---|---|---|---|
| | *(Mg/year)* | *(short tons/year)* | *(Mg)* | *(short tons)* |
| 2045 | 1,134,545 | 1,248,000 | 35,019,450 | 38,521,395 |
| 2046 | 1,134,545 | 1,248,000 | 36,153,996 | 39,769,395 |
| 2047 | 1,134,545 | 1,248,000 | 37,288,541 | 41,017,395 |
| 2048 | 1,134,545 | 1,248,000 | 38,423,087 | 42,265,395 |
| 2049 | 1,134,545 | 1,248,000 | 39,557,632 | 43,513,395 |
| 2050 | 1,134,545 | 1,248,000 | 40,692,178 | 44,761,395 |
| 2051 | 1,134,545 | 1,248,000 | 41,826,723 | 46,009,395 |
| 2052 | 620,537 | 682,591 | 42,961,268 | 47,257,395 |
| 2053 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2054 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2055 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2056 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2057 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2058 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2059 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2060 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2061 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2062 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2063 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2064 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2065 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2066 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2067 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2068 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2069 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2070 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2071 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2072 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2073 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2074 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2075 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2076 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2077 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2078 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2079 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2080 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2081 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2082 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2083 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2084 | 0 | 0 | 43,581,805 | 47,939,986 |

## Pollutant Parameters

| | | Gas / Pollutant Default Parameters: | | User-specified Pollutant Parameters: | |
|---|---|---|---|---|---|
| | Compound | Concentration (*ppmv*) | Molecular Weight | Concentration (*ppmv*) | Molecular Weight |
| Gases | Total landfill gas | | 0.00 | | |
| | Methane | | 16.04 | | |
| | Carbon dioxide | | 44.01 | | |
| | NMOC | 4,000 | 86.18 | | |
| Pollutants | 1,1,1-Trichloroethane (methyl chloroform) - HAP | 0.48 | 133.41 | | |
| | 1,1,2,2-Tetrachloroethane - HAP/VOC | 1.1 | 167.85 | | |
| | 1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC | 2.4 | 98.97 | | |
| | 1,1-Dichloroethene (vinylidene chloride) - HAP/VOC | 0.20 | 96.94 | | |
| | 1,2-Dichloroethane (ethylene dichloride) - HAP/VOC | 0.41 | 98.96 | | |
| | 1,2-Dichloropropane (propylene dichloride) - HAP/VOC | 0.18 | 112.99 | | |
| | 2-Propanol (isopropyl alcohol) - VOC | 50 | 60.11 | | |
| | Acetone | 7.0 | 58.08 | | |
| | Acrylonitrile - HAP/VOC | 6.3 | 53.06 | | |
| | Benzene - No or Unknown Co-disposal - HAP/VOC | 1.9 | 78.11 | | |
| | Benzene - Co-disposal - HAP/VOC | 11 | 78.11 | | |
| | Bromodichloromethane - VOC | 3.1 | 163.83 | | |
| | Butane - VOC | 5.0 | 58.12 | | |
| | Carbon disulfide - HAP/VOC | 0.58 | 76.13 | | |
| | Carbon monoxide | 140 | 28.01 | | |
| | Carbon tetrachloride - HAP/VOC | 4.0E-03 | 153.84 | | |
| | Carbonyl sulfide - HAP/VOC | 0.49 | 60.07 | | |
| | Chlorobenzene - HAP/VOC | 0.25 | 112.56 | | |
| | Chlorodifluoromethane | 1.3 | 86.47 | | |
| | Chloroethane (ethyl chloride) - HAP/VOC | 1.3 | 64.52 | | |
| | Chloroform - HAP/VOC | 0.03 | 119.39 | | |
| | Chloromethane - VOC | 1.2 | 50.49 | | |
| | Dichlorobenzene - (HAP for para isomer/VOC) | 0.21 | 147 | | |
| | Dichlorodifluoromethane | 16 | 120.91 | | |
| | Dichlorofluoromethane - VOC | 2.6 | 102.92 | | |
| | Dichloromethane (methylene chloride) - HAP | 14 | 84.94 | | |
| | Dimethyl sulfide (methyl sulfide) - VOC | 7.8 | 62.13 | | |
| | Ethane | 890 | 30.07 | | |
| | Ethanol - VOC | 27 | 46.08 | | |

## Pollutant Parameters (Continued)

| | Compound | Gas / Pollutant Default Parameters: Concentration (*ppmv*) | Molecular Weight | User-specified Pollutant Parameters: Concentration (*ppmv*) | Molecular Weight |
|---|---|---|---|---|---|
| Pollutants | Ethyl mercaptan (ethanethiol) - VOC | 2.3 | 62.13 | | |
| | Ethylbenzene - HAP/VOC | 4.6 | 106.16 | | |
| | Ethylene dibromide - HAP/VOC | 1.0E-03 | 187.88 | | |
| | Fluorotrichloromethane - VOC | 0.76 | 137.38 | | |
| | Hexane - HAP/VOC | 6.6 | 86.18 | | |
| | Hydrogen sulfide | 36 | 34.08 | | |
| | Mercury (total) - HAP | 2.9E-04 | 200.61 | | |
| | Methyl ethyl ketone - HAP/VOC | 7.1 | 72.11 | | |
| | Methyl isobutyl ketone - HAP/VOC | 1.9 | 100.16 | | |
| | Methyl mercaptan - VOC | 2.5 | 48.11 | | |
| | Pentane - VOC | 3.3 | 72.15 | | |
| | Perchloroethylene (tetrachloroethylene) - HAP | 3.7 | 165.83 | | |
| | Propane - VOC | 11 | 44.09 | | |
| | t-1,2-Dichloroethene - VOC | 2.8 | 96.94 | | |
| | Toluene - No or Unknown Co-disposal - HAP/VOC | 39 | 92.13 | | |
| | Toluene - Co-disposal - HAP/VOC | 170 | 92.13 | | |
| | Trichloroethylene (trichloroethene) - HAP/VOC | 2.8 | 131.40 | | |
| | Vinyl chloride - HAP/VOC | 7.3 | 62.50 | | |
| | Xylenes - HAP/VOC | 12 | 106.16 | | |
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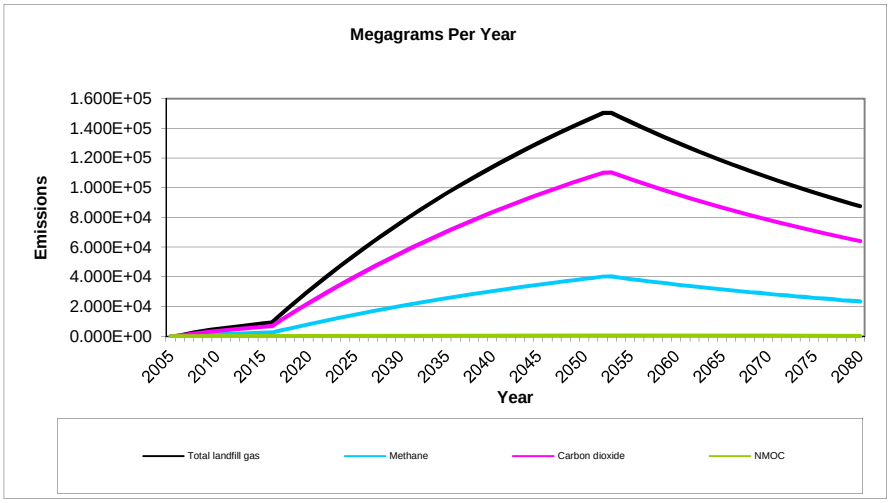
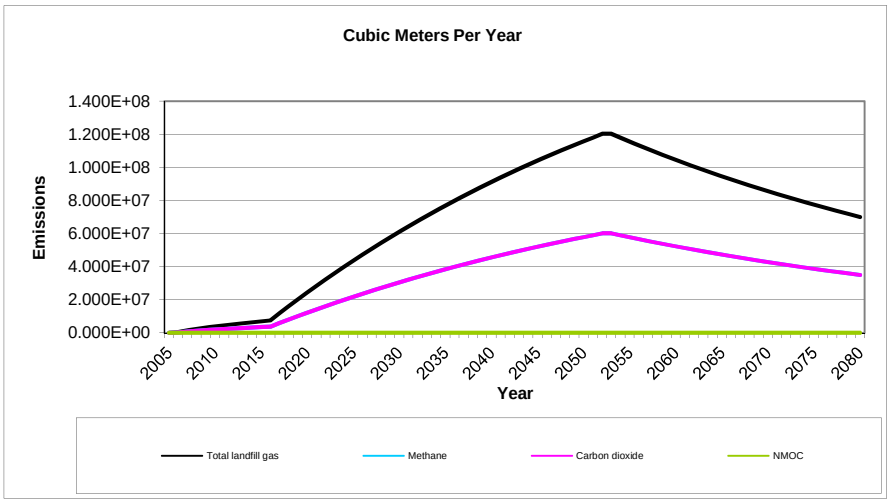
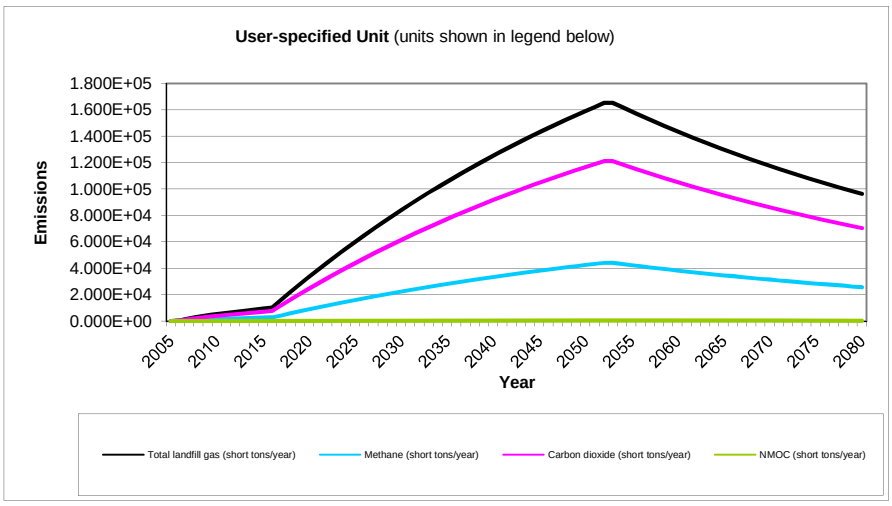
## Graphs


Megagrams Per Year
Emissions
1.600E+05
1.400E+05
1.200E+05
1.000E+05
8.000E+04
6.000E+04
4.000E+04
2.000E+04
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
1.400E+08
1.200E+08
1.000E+08
8.000E+07
6.000E+07
4.000E+07
2.000E+07
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
1.800E+05
1.600E+05
1.400E+05
1.200E+05
1.000E+05
8.000E+04
6.000E+04
4.000E+04
2.000E+04
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas (short tons/year)
Methane (short tons/year)
Carbon dioxide (short tons/year)
NMOC (short tons/year)

## Results

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 6.943E+02 | 5.560E+05 | 7.637E+02 | 1.855E+02 | 2.780E+05 | 2.040E+02 |
| 2007 | 2.008E+03 | 1.608E+06 | 2.209E+03 | 5.363E+02 | 8.039E+05 | 5.900E+02 |
| 2008 | 3.278E+03 | 2.625E+06 | 3.606E+03 | 8.755E+02 | 1.312E+06 | 9.631E+02 |
| 2009 | 4.168E+03 | 3.338E+06 | 4.585E+03 | 1.113E+03 | 1.669E+06 | 1.225E+03 |
| 2010 | 5.004E+03 | 4.007E+06 | 5.505E+03 | 1.337E+03 | 2.004E+06 | 1.470E+03 |
| 2011 | 5.747E+03 | 4.602E+06 | 6.322E+03 | 1.535E+03 | 2.301E+06 | 1.689E+03 |
| 2012 | 6.542E+03 | 5.238E+06 | 7.196E+03 | 1.747E+03 | 2.619E+06 | 1.922E+03 |
| 2013 | 7.268E+03 | 5.820E+06 | 7.995E+03 | 1.941E+03 | 2.910E+06 | 2.135E+03 |
| 2014 | 7.961E+03 | 6.375E+06 | 8.757E+03 | 2.126E+03 | 3.187E+06 | 2.339E+03 |
| 2015 | 8.775E+03 | 7.026E+06 | 9.652E+03 | 2.344E+03 | 3.513E+06 | 2.578E+03 |
| 2016 | 9.465E+03 | 7.579E+06 | 1.041E+04 | 2.528E+03 | 3.790E+06 | 2.781E+03 |
| 2017 | 1.489E+04 | 1.193E+07 | 1.638E+04 | 3.978E+03 | 5.963E+06 | 4.376E+03 |
| 2018 | 2.022E+04 | 1.619E+07 | 2.224E+04 | 5.400E+03 | 8.094E+06 | 5.940E+03 |
| 2019 | 2.543E+04 | 2.037E+07 | 2.798E+04 | 6.793E+03 | 1.018E+07 | 7.473E+03 |
| 2020 | 3.055E+04 | 2.446E+07 | 3.360E+04 | 8.159E+03 | 1.223E+07 | 8.975E+03 |
| 2021 | 3.556E+04 | 2.847E+07 | 3.911E+04 | 9.498E+03 | 1.424E+07 | 1.045E+04 |
| 2022 | 4.047E+04 | 3.241E+07 | 4.452E+04 | 1.081E+04 | 1.620E+07 | 1.189E+04 |
| 2023 | 4.529E+04 | 3.626E+07 | 4.981E+04 | 1.210E+04 | 1.813E+07 | 1.331E+04 |
| 2024 | 5.001E+04 | 4.004E+07 | 5.501E+04 | 1.336E+04 | 2.002E+07 | 1.469E+04 |
| 2025 | 5.463E+04 | 4.375E+07 | 6.010E+04 | 1.459E+04 | 2.187E+07 | 1.605E+04 |
| 2026 | 5.917E+04 | 4.738E+07 | 6.508E+04 | 1.580E+04 | 2.369E+07 | 1.738E+04 |
| 2027 | 6.361E+04 | 5.094E+07 | 6.997E+04 | 1.699E+04 | 2.547E+07 | 1.869E+04 |
| 2028 | 6.797E+04 | 5.443E+07 | 7.477E+04 | 1.816E+04 | 2.721E+07 | 1.997E+04 |
| 2029 | 7.224E+04 | 5.785E+07 | 7.946E+04 | 1.930E+04 | 2.892E+07 | 2.123E+04 |
| 2030 | 7.643E+04 | 6.120E+07 | 8.407E+04 | 2.041E+04 | 3.060E+07 | 2.246E+04 |
| 2031 | 8.053E+04 | 6.448E+07 | 8.858E+04 | 2.151E+04 | 3.224E+07 | 2.366E+04 |
| 2032 | 8.455E+04 | 6.770E+07 | 9.301E+04 | 2.258E+04 | 3.385E+07 | 2.484E+04 |
| 2033 | 8.849E+04 | 7.086E+07 | 9.734E+04 | 2.364E+04 | 3.543E+07 | 2.600E+04 |
| 2034 | 9.236E+04 | 7.396E+07 | 1.016E+05 | 2.467E+04 | 3.698E+07 | 2.714E+04 |
| 2035 | 9.615E+04 | 7.699E+07 | 1.058E+05 | 2.568E+04 | 3.849E+07 | 2.825E+04 |
| 2036 | 9.986E+04 | 7.996E+07 | 1.098E+05 | 2.667E+04 | 3.998E+07 | 2.934E+04 |
| 2037 | 1.035E+05 | 8.288E+07 | 1.138E+05 | 2.765E+04 | 4.144E+07 | 3.041E+04 |
| 2038 | 1.071E+05 | 8.573E+07 | 1.178E+05 | 2.860E+04 | 4.287E+07 | 3.146E+04 |
| 2039 | 1.106E+05 | 8.853E+07 | 1.216E+05 | 2.953E+04 | 4.427E+07 | 3.249E+04 |
| 2040 | 1.140E+05 | 9.128E+07 | 1.254E+05 | 3.045E+04 | 4.564E+07 | 3.349E+04 |
| 2041 | 1.173E+05 | 9.397E+07 | 1.291E+05 | 3.135E+04 | 4.698E+07 | 3.448E+04 |
| 2042 | 1.206E+05 | 9.660E+07 | 1.327E+05 | 3.222E+04 | 4.830E+07 | 3.545E+04 |
| 2043 | 1.239E+05 | 9.919E+07 | 1.363E+05 | 3.309E+04 | 4.959E+07 | 3.640E+04 |
| 2044 | 1.270E+05 | 1.017E+08 | 1.397E+05 | 3.393E+04 | 5.086E+07 | 3.733E+04 |
| 2045 | 1.301E+05 | 1.042E+08 | 1.431E+05 | 3.476E+04 | 5.210E+07 | 3.824E+04 |
| 2046 | 1.332E+05 | 1.066E+08 | 1.465E+05 | 3.557E+04 | 5.332E+07 | 3.913E+04 |
| 2047 | 1.362E+05 | 1.090E+08 | 1.498E+05 | 3.637E+04 | 5.451E+07 | 4.001E+04 |
| 2048 | 1.391E+05 | 1.114E+08 | 1.530E+05 | 3.715E+04 | 5.568E+07 | 4.086E+04 |
| 2049 | 1.419E+05 | 1.137E+08 | 1.561E+05 | 3.791E+04 | 5.683E+07 | 4.170E+04 |
| 2050 | 1.447E+05 | 1.159E+08 | 1.592E+05 | 3.866E+04 | 5.795E+07 | 4.253E+04 |
| 2051 | 1.475E+05 | 1.181E+08 | 1.622E+05 | 3.940E+04 | 5.905E+07 | 4.334E+04 |
| 2052 | 1.502E+05 | 1.203E+08 | 1.652E+05 | 4.012E+04 | 6.013E+07 | 4.413E+04 |
| 2053 | 1.503E+05 | 1.203E+08 | 1.653E+05 | 4.014E+04 | 6.017E+07 | 4.416E+04 |
| 2054 | 1.473E+05 | 1.180E+08 | 1.620E+05 | 3.935E+04 | 5.898E+07 | 4.328E+04 |

## Results (Continued)

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2055 | 1.444E+05 | 1.156E+08 | 1.588E+05 | 3.857E+04 | 5.781E+07 | 4.243E+04 |
| 2056 | 1.415E+05 | 1.133E+08 | 1.557E+05 | 3.781E+04 | 5.667E+07 | 4.159E+04 |
| 2057 | 1.387E+05 | 1.111E+08 | 1.526E+05 | 3.706E+04 | 5.555E+07 | 4.076E+04 |
| 2058 | 1.360E+05 | 1.089E+08 | 1.496E+05 | 3.632E+04 | 5.445E+07 | 3.996E+04 |
| 2059 | 1.333E+05 | 1.067E+08 | 1.466E+05 | 3.560E+04 | 5.337E+07 | 3.916E+04 |
| 2060 | 1.307E+05 | 1.046E+08 | 1.437E+05 | 3.490E+04 | 5.231E+07 | 3.839E+04 |
| 2061 | 1.281E+05 | 1.026E+08 | 1.409E+05 | 3.421E+04 | 5.128E+07 | 3.763E+04 |
| 2062 | 1.255E+05 | 1.005E+08 | 1.381E+05 | 3.353E+04 | 5.026E+07 | 3.688E+04 |
| 2063 | 1.230E+05 | 9.853E+07 | 1.354E+05 | 3.287E+04 | 4.926E+07 | 3.615E+04 |
| 2064 | 1.206E+05 | 9.658E+07 | 1.327E+05 | 3.222E+04 | 4.829E+07 | 3.544E+04 |
| 2065 | 1.182E+05 | 9.467E+07 | 1.300E+05 | 3.158E+04 | 4.733E+07 | 3.474E+04 |
| 2066 | 1.159E+05 | 9.279E+07 | 1.275E+05 | 3.095E+04 | 4.640E+07 | 3.405E+04 |
| 2067 | 1.136E+05 | 9.095E+07 | 1.249E+05 | 3.034E+04 | 4.548E+07 | 3.337E+04 |
| 2068 | 1.113E+05 | 8.915E+07 | 1.225E+05 | 2.974E+04 | 4.458E+07 | 3.271E+04 |
| 2069 | 1.091E+05 | 8.739E+07 | 1.200E+05 | 2.915E+04 | 4.369E+07 | 3.207E+04 |
| 2070 | 1.070E+05 | 8.566E+07 | 1.177E+05 | 2.857E+04 | 4.283E+07 | 3.143E+04 |
| 2071 | 1.049E+05 | 8.396E+07 | 1.153E+05 | 2.801E+04 | 4.198E+07 | 3.081E+04 |
| 2072 | 1.028E+05 | 8.230E+07 | 1.131E+05 | 2.745E+04 | 4.115E+07 | 3.020E+04 |
| 2073 | 1.007E+05 | 8.067E+07 | 1.108E+05 | 2.691E+04 | 4.033E+07 | 2.960E+04 |
| 2074 | 9.875E+04 | 7.907E+07 | 1.086E+05 | 2.638E+04 | 3.954E+07 | 2.901E+04 |
| 2075 | 9.679E+04 | 7.751E+07 | 1.065E+05 | 2.585E+04 | 3.875E+07 | 2.844E+04 |
| 2076 | 9.488E+04 | 7.597E+07 | 1.044E+05 | 2.534E+04 | 3.799E+07 | 2.788E+04 |
| 2077 | 9.300E+04 | 7.447E+07 | 1.023E+05 | 2.484E+04 | 3.723E+07 | 2.732E+04 |
| 2078 | 9.116E+04 | 7.299E+07 | 1.003E+05 | 2.435E+04 | 3.650E+07 | 2.678E+04 |
| 2079 | 8.935E+04 | 7.155E+07 | 9.829E+04 | 2.387E+04 | 3.577E+07 | 2.625E+04 |
| 2080 | 8.758E+04 | 7.013E+07 | 9.634E+04 | 2.339E+04 | 3.507E+07 | 2.573E+04 |
| 2081 | 8.585E+04 | 6.874E+07 | 9.443E+04 | 2.293E+04 | 3.437E+07 | 2.522E+04 |
| 2082 | 8.415E+04 | 6.738E+07 | 9.256E+04 | 2.248E+04 | 3.369E+07 | 2.472E+04 |
| 2083 | 8.248E+04 | 6.605E+07 | 9.073E+04 | 2.203E+04 | 3.302E+07 | 2.423E+04 |
| 2084 | 8.085E+04 | 6.474E+07 | 8.893E+04 | 2.160E+04 | 3.237E+07 | 2.375E+04 |
| 2085 | 7.925E+04 | 6.346E+07 | 8.717E+04 | 2.117E+04 | 3.173E+07 | 2.328E+04 |
| 2086 | 7.768E+04 | 6.220E+07 | 8.544E+04 | 2.075E+04 | 3.110E+07 | 2.282E+04 |
| 2087 | 7.614E+04 | 6.097E+07 | 8.375E+04 | 2.034E+04 | 3.048E+07 | 2.237E+04 |
| 2088 | 7.463E+04 | 5.976E+07 | 8.209E+04 | 1.993E+04 | 2.988E+07 | 2.193E+04 |
| 2089 | 7.315E+04 | 5.858E+07 | 8.047E+04 | 1.954E+04 | 2.929E+07 | 2.149E+04 |
| 2090 | 7.171E+04 | 5.742E+07 | 7.888E+04 | 1.915E+04 | 2.871E+07 | 2.107E+04 |
| 2091 | 7.029E+04 | 5.628E+07 | 7.731E+04 | 1.877E+04 | 2.814E+07 | 2.065E+04 |
| 2092 | 6.889E+04 | 5.517E+07 | 7.578E+04 | 1.840E+04 | 2.758E+07 | 2.024E+04 |
| 2093 | 6.753E+04 | 5.407E+07 | 7.428E+04 | 1.804E+04 | 2.704E+07 | 1.984E+04 |
| 2094 | 6.619E+04 | 5.300E+07 | 7.281E+04 | 1.768E+04 | 2.650E+07 | 1.945E+04 |
| 2095 | 6.488E+04 | 5.195E+07 | 7.137E+04 | 1.733E+04 | 2.598E+07 | 1.906E+04 |
| 2096 | 6.360E+04 | 5.093E+07 | 6.996E+04 | 1.699E+04 | 2.546E+07 | 1.869E+04 |
| 2097 | 6.234E+04 | 4.992E+07 | 6.857E+04 | 1.665E+04 | 2.496E+07 | 1.832E+04 |
| 2098 | 6.110E+04 | 4.893E+07 | 6.721E+04 | 1.632E+04 | 2.446E+07 | 1.795E+04 |
| 2099 | 5.989E+04 | 4.796E+07 | 6.588E+04 | 1.600E+04 | 2.398E+07 | 1.760E+04 |
| 2100 | 5.871E+04 | 4.701E+07 | 6.458E+04 | 1.568E+04 | 2.350E+07 | 1.725E+04 |
| 2101 | 5.754E+04 | 4.608E+07 | 6.330E+04 | 1.537E+04 | 2.304E+07 | 1.691E+04 |
| 2102 | 5.641E+04 | 4.517E+07 | 6.205E+04 | 1.507E+04 | 2.258E+07 | 1.657E+04 |
| 2103 | 5.529E+04 | 4.427E+07 | 6.082E+04 | 1.477E+04 | 2.214E+07 | 1.624E+04 |
| 2104 | 5.419E+04 | 4.340E+07 | 5.961E+04 | 1.448E+04 | 2.170E+07 | 1.592E+04 |
| 2105 | 5.312E+04 | 4.254E+07 | 5.843E+04 | 1.419E+04 | 2.127E+07 | 1.561E+04 |

## Results (Continued)

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2106 | 5.207E+04 | 4.169E+07 | 5.728E+04 | 1.391E+04 | 2.085E+07 | 1.530E+04 |
| 2107 | 5.104E+04 | 4.087E+07 | 5.614E+04 | 1.363E+04 | 2.043E+07 | 1.500E+04 |
| 2108 | 5.003E+04 | 4.006E+07 | 5.503E+04 | 1.336E+04 | 2.003E+07 | 1.470E+04 |
| 2109 | 4.904E+04 | 3.927E+07 | 5.394E+04 | 1.310E+04 | 1.963E+07 | 1.441E+04 |
| 2110 | 4.807E+04 | 3.849E+07 | 5.287E+04 | 1.284E+04 | 1.924E+07 | 1.412E+04 |
| 2111 | 4.711E+04 | 3.773E+07 | 5.182E+04 | 1.258E+04 | 1.886E+07 | 1.384E+04 |
| 2112 | 4.618E+04 | 3.698E+07 | 5.080E+04 | 1.234E+04 | 1.849E+07 | 1.357E+04 |
| 2113 | 4.527E+04 | 3.625E+07 | 4.979E+04 | 1.209E+04 | 1.812E+07 | 1.330E+04 |
| 2114 | 4.437E+04 | 3.553E+07 | 4.881E+04 | 1.185E+04 | 1.776E+07 | 1.304E+04 |
| 2115 | 4.349E+04 | 3.483E+07 | 4.784E+04 | 1.162E+04 | 1.741E+07 | 1.278E+04 |
| 2116 | 4.263E+04 | 3.414E+07 | 4.689E+04 | 1.139E+04 | 1.707E+07 | 1.253E+04 |
| 2117 | 4.179E+04 | 3.346E+07 | 4.596E+04 | 1.116E+04 | 1.673E+07 | 1.228E+04 |
| 2118 | 4.096E+04 | 3.280E+07 | 4.505E+04 | 1.094E+04 | 1.640E+07 | 1.203E+04 |
| 2119 | 4.015E+04 | 3.215E+07 | 4.416E+04 | 1.072E+04 | 1.607E+07 | 1.180E+04 |
| 2120 | 3.935E+04 | 3.151E+07 | 4.329E+04 | 1.051E+04 | 1.576E+07 | 1.156E+04 |
| 2121 | 3.857E+04 | 3.089E+07 | 4.243E+04 | 1.030E+04 | 1.544E+07 | 1.133E+04 |
| 2122 | 3.781E+04 | 3.028E+07 | 4.159E+04 | 1.010E+04 | 1.514E+07 | 1.111E+04 |
| 2123 | 3.706E+04 | 2.968E+07 | 4.077E+04 | 9.899E+03 | 1.484E+07 | 1.089E+04 |
| 2124 | 3.633E+04 | 2.909E+07 | 3.996E+04 | 9.703E+03 | 1.454E+07 | 1.067E+04 |
| 2125 | 3.561E+04 | 2.851E+07 | 3.917E+04 | 9.511E+03 | 1.426E+07 | 1.046E+04 |
| 2126 | 3.490E+04 | 2.795E+07 | 3.839E+04 | 9.323E+03 | 1.397E+07 | 1.026E+04 |
| 2127 | 3.421E+04 | 2.739E+07 | 3.763E+04 | 9.138E+03 | 1.370E+07 | 1.005E+04 |
| 2128 | 3.353E+04 | 2.685E+07 | 3.689E+04 | 8.957E+03 | 1.343E+07 | 9.853E+03 |
| 2129 | 3.287E+04 | 2.632E+07 | 3.616E+04 | 8.780E+03 | 1.316E+07 | 9.658E+03 |
| 2130 | 3.222E+04 | 2.580E+07 | 3.544E+04 | 8.606E+03 | 1.290E+07 | 9.467E+03 |
| 2131 | 3.158E+04 | 2.529E+07 | 3.474E+04 | 8.436E+03 | 1.264E+07 | 9.279E+03 |
| 2132 | 3.096E+04 | 2.479E+07 | 3.405E+04 | 8.269E+03 | 1.239E+07 | 9.096E+03 |
| 2133 | 3.034E+04 | 2.430E+07 | 3.338E+04 | 8.105E+03 | 1.215E+07 | 8.915E+03 |
| 2134 | 2.974E+04 | 2.382E+07 | 3.272E+04 | 7.944E+03 | 1.191E+07 | 8.739E+03 |
| 2135 | 2.915E+04 | 2.334E+07 | 3.207E+04 | 7.787E+03 | 1.167E+07 | 8.566E+03 |
| 2136 | 2.858E+04 | 2.288E+07 | 3.143E+04 | 7.633E+03 | 1.144E+07 | 8.396E+03 |
| 2137 | 2.801E+04 | 2.243E+07 | 3.081E+04 | 7.482E+03 | 1.121E+07 | 8.230E+03 |
| 2138 | 2.746E+04 | 2.198E+07 | 3.020E+04 | 7.334E+03 | 1.099E+07 | 8.067E+03 |
| 2139 | 2.691E+04 | 2.155E+07 | 2.960E+04 | 7.188E+03 | 1.077E+07 | 7.907E+03 |
| 2140 | 2.638E+04 | 2.112E+07 | 2.902E+04 | 7.046E+03 | 1.056E+07 | 7.751E+03 |
| 2141 | 2.586E+04 | 2.070E+07 | 2.844E+04 | 6.907E+03 | 1.035E+07 | 7.597E+03 |
| 2142 | 2.534E+04 | 2.029E+07 | 2.788E+04 | 6.770E+03 | 1.015E+07 | 7.447E+03 |
| 2143 | 2.484E+04 | 1.989E+07 | 2.733E+04 | 6.636E+03 | 9.946E+06 | 7.299E+03 |
| 2144 | 2.435E+04 | 1.950E+07 | 2.679E+04 | 6.504E+03 | 9.749E+06 | 7.155E+03 |
| 2145 | 2.387E+04 | 1.911E+07 | 2.626E+04 | 6.376E+03 | 9.556E+06 | 7.013E+03 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 5.088E+02 | 2.780E+05 | 5.597E+02 | 1.923E+00 | 5.365E+02 | 2.115E+00 |
| 2007 | 1.472E+03 | 8.039E+05 | 1.619E+03 | 5.562E+00 | 1.552E+03 | 6.118E+00 |
| 2008 | 2.402E+03 | 1.312E+06 | 2.642E+03 | 9.079E+00 | 2.533E+03 | 9.987E+00 |
| 2009 | 3.055E+03 | 1.669E+06 | 3.360E+03 | 1.155E+01 | 3.221E+03 | 1.270E+01 |
| 2010 | 3.667E+03 | 2.004E+06 | 4.034E+03 | 1.386E+01 | 3.867E+03 | 1.525E+01 |
| 2011 | 4.212E+03 | 2.301E+06 | 4.633E+03 | 1.592E+01 | 4.441E+03 | 1.751E+01 |
| 2012 | 4.794E+03 | 2.619E+06 | 5.274E+03 | 1.812E+01 | 5.055E+03 | 1.993E+01 |
| 2013 | 5.327E+03 | 2.910E+06 | 5.859E+03 | 2.013E+01 | 5.616E+03 | 2.214E+01 |
| 2014 | 5.835E+03 | 3.187E+06 | 6.418E+03 | 2.205E+01 | 6.152E+03 | 2.426E+01 |
| 2015 | 6.431E+03 | 3.513E+06 | 7.074E+03 | 2.430E+01 | 6.780E+03 | 2.673E+01 |
| 2016 | 6.937E+03 | 3.790E+06 | 7.630E+03 | 2.622E+01 | 7.314E+03 | 2.884E+01 |
| 2017 | 1.092E+04 | 5.963E+06 | 1.201E+04 | 4.125E+01 | 1.151E+04 | 4.538E+01 |
| 2018 | 1.482E+04 | 8.094E+06 | 1.630E+04 | 5.599E+01 | 1.562E+04 | 6.159E+01 |
| 2019 | 1.864E+04 | 1.018E+07 | 2.050E+04 | 7.044E+01 | 1.965E+04 | 7.749E+01 |
| 2020 | 2.239E+04 | 1.223E+07 | 2.463E+04 | 8.461E+01 | 2.360E+04 | 9.307E+01 |
| 2021 | 2.606E+04 | 1.424E+07 | 2.867E+04 | 9.849E+01 | 2.748E+04 | 1.083E+02 |
| 2022 | 2.966E+04 | 1.620E+07 | 3.263E+04 | 1.121E+02 | 3.127E+04 | 1.233E+02 |
| 2023 | 3.319E+04 | 1.813E+07 | 3.651E+04 | 1.254E+02 | 3.499E+04 | 1.380E+02 |
| 2024 | 3.665E+04 | 2.002E+07 | 4.031E+04 | 1.385E+02 | 3.864E+04 | 1.524E+02 |
| 2025 | 4.004E+04 | 2.187E+07 | 4.404E+04 | 1.513E+02 | 4.222E+04 | 1.665E+02 |
| 2026 | 4.336E+04 | 2.369E+07 | 4.770E+04 | 1.639E+02 | 4.572E+04 | 1.803E+02 |
| 2027 | 4.662E+04 | 2.547E+07 | 5.128E+04 | 1.762E+02 | 4.915E+04 | 1.938E+02 |
| 2028 | 4.981E+04 | 2.721E+07 | 5.480E+04 | 1.883E+02 | 5.252E+04 | 2.071E+02 |
| 2029 | 5.294E+04 | 2.892E+07 | 5.824E+04 | 2.001E+02 | 5.582E+04 | 2.201E+02 |
| 2030 | 5.601E+04 | 3.060E+07 | 6.161E+04 | 2.117E+02 | 5.906E+04 | 2.329E+02 |
| 2031 | 5.902E+04 | 3.224E+07 | 6.492E+04 | 2.231E+02 | 6.223E+04 | 2.454E+02 |
| 2032 | 6.197E+04 | 3.385E+07 | 6.816E+04 | 2.342E+02 | 6.534E+04 | 2.576E+02 |
| 2033 | 6.486E+04 | 3.543E+07 | 7.134E+04 | 2.451E+02 | 6.838E+04 | 2.696E+02 |
| 2034 | 6.769E+04 | 3.698E+07 | 7.446E+04 | 2.558E+02 | 7.137E+04 | 2.814E+02 |
| 2035 | 7.046E+04 | 3.849E+07 | 7.751E+04 | 2.663E+02 | 7.429E+04 | 2.929E+02 |
| 2036 | 7.319E+04 | 3.998E+07 | 8.050E+04 | 2.766E+02 | 7.716E+04 | 3.043E+02 |
| 2037 | 7.585E+04 | 4.144E+07 | 8.344E+04 | 2.867E+02 | 7.998E+04 | 3.153E+02 |
| 2038 | 7.847E+04 | 4.287E+07 | 8.631E+04 | 2.966E+02 | 8.273E+04 | 3.262E+02 |
| 2039 | 8.103E+04 | 4.427E+07 | 8.913E+04 | 3.062E+02 | 8.543E+04 | 3.369E+02 |
| 2040 | 8.354E+04 | 4.564E+07 | 9.190E+04 | 3.157E+02 | 8.808E+04 | 3.473E+02 |
| 2041 | 8.600E+04 | 4.698E+07 | 9.460E+04 | 3.250E+02 | 9.068E+04 | 3.575E+02 |
| 2042 | 8.842E+04 | 4.830E+07 | 9.726E+04 | 3.342E+02 | 9.322E+04 | 3.676E+02 |
| 2043 | 9.078E+04 | 4.959E+07 | 9.986E+04 | 3.431E+02 | 9.572E+04 | 3.774E+02 |
| 2044 | 9.310E+04 | 5.086E+07 | 1.024E+05 | 3.519E+02 | 9.816E+04 | 3.870E+02 |
| 2045 | 9.537E+04 | 5.210E+07 | 1.049E+05 | 3.605E+02 | 1.006E+05 | 3.965E+02 |
| 2046 | 9.760E+04 | 5.332E+07 | 1.074E+05 | 3.689E+02 | 1.029E+05 | 4.058E+02 |
| 2047 | 9.979E+04 | 5.451E+07 | 1.098E+05 | 3.771E+02 | 1.052E+05 | 4.148E+02 |
| 2048 | 1.019E+05 | 5.568E+07 | 1.121E+05 | 3.852E+02 | 1.075E+05 | 4.237E+02 |
| 2049 | 1.040E+05 | 5.683E+07 | 1.144E+05 | 3.931E+02 | 1.097E+05 | 4.325E+02 |
| 2050 | 1.061E+05 | 5.795E+07 | 1.167E+05 | 4.009E+02 | 1.118E+05 | 4.410E+02 |
| 2051 | 1.081E+05 | 5.905E+07 | 1.189E+05 | 4.085E+02 | 1.140E+05 | 4.494E+02 |
| 2052 | 1.101E+05 | 6.013E+07 | 1.211E+05 | 4.160E+02 | 1.161E+05 | 4.576E+02 |
| 2053 | 1.101E+05 | 6.017E+07 | 1.212E+05 | 4.163E+02 | 1.161E+05 | 4.579E+02 |
| 2054 | 1.080E+05 | 5.898E+07 | 1.188E+05 | 4.080E+02 | 1.138E+05 | 4.488E+02 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2055 | 1.058E+05 | 5.781E+07 | 1.164E+05 | 4.000E+02 | 1.116E+05 | 4.399E+02 |
| 2056 | 1.037E+05 | 5.667E+07 | 1.141E+05 | 3.920E+02 | 1.094E+05 | 4.312E+02 |
| 2057 | 1.017E+05 | 5.555E+07 | 1.118E+05 | 3.843E+02 | 1.072E+05 | 4.227E+02 |
| 2058 | 9.966E+04 | 5.445E+07 | 1.096E+05 | 3.767E+02 | 1.051E+05 | 4.143E+02 |
| 2059 | 9.769E+04 | 5.337E+07 | 1.075E+05 | 3.692E+02 | 1.030E+05 | 4.061E+02 |
| 2060 | 9.576E+04 | 5.231E+07 | 1.053E+05 | 3.619E+02 | 1.010E+05 | 3.981E+02 |
| 2061 | 9.386E+04 | 5.128E+07 | 1.032E+05 | 3.547E+02 | 9.896E+04 | 3.902E+02 |
| 2062 | 9.200E+04 | 5.026E+07 | 1.012E+05 | 3.477E+02 | 9.700E+04 | 3.825E+02 |
| 2063 | 9.018E+04 | 4.926E+07 | 9.920E+04 | 3.408E+02 | 9.508E+04 | 3.749E+02 |
| 2064 | 8.839E+04 | 4.829E+07 | 9.723E+04 | 3.341E+02 | 9.320E+04 | 3.675E+02 |
| 2065 | 8.664E+04 | 4.733E+07 | 9.531E+04 | 3.275E+02 | 9.135E+04 | 3.602E+02 |
| 2066 | 8.493E+04 | 4.640E+07 | 9.342E+04 | 3.210E+02 | 8.954E+04 | 3.531E+02 |
| 2067 | 8.325E+04 | 4.548E+07 | 9.157E+04 | 3.146E+02 | 8.777E+04 | 3.461E+02 |
| 2068 | 8.160E+04 | 4.458E+07 | 8.976E+04 | 3.084E+02 | 8.603E+04 | 3.392E+02 |
| 2069 | 7.998E+04 | 4.369E+07 | 8.798E+04 | 3.023E+02 | 8.433E+04 | 3.325E+02 |
| 2070 | 7.840E+04 | 4.283E+07 | 8.624E+04 | 2.963E+02 | 8.266E+04 | 3.259E+02 |
| 2071 | 7.685E+04 | 4.198E+07 | 8.453E+04 | 2.904E+02 | 8.102E+04 | 3.195E+02 |
| 2072 | 7.532E+04 | 4.115E+07 | 8.286E+04 | 2.847E+02 | 7.942E+04 | 3.131E+02 |
| 2073 | 7.383E+04 | 4.033E+07 | 8.122E+04 | 2.790E+02 | 7.785E+04 | 3.069E+02 |
| 2074 | 7.237E+04 | 3.954E+07 | 7.961E+04 | 2.735E+02 | 7.630E+04 | 3.009E+02 |
| 2075 | 7.094E+04 | 3.875E+07 | 7.803E+04 | 2.681E+02 | 7.479E+04 | 2.949E+02 |
| 2076 | 6.953E+04 | 3.799E+07 | 7.649E+04 | 2.628E+02 | 7.331E+04 | 2.891E+02 |
| 2077 | 6.816E+04 | 3.723E+07 | 7.497E+04 | 2.576E+02 | 7.186E+04 | 2.833E+02 |
| 2078 | 6.681E+04 | 3.650E+07 | 7.349E+04 | 2.525E+02 | 7.044E+04 | 2.777E+02 |
| 2079 | 6.548E+04 | 3.577E+07 | 7.203E+04 | 2.475E+02 | 6.904E+04 | 2.722E+02 |
| 2080 | 6.419E+04 | 3.507E+07 | 7.061E+04 | 2.426E+02 | 6.768E+04 | 2.668E+02 |
| 2081 | 6.292E+04 | 3.437E+07 | 6.921E+04 | 2.378E+02 | 6.634E+04 | 2.616E+02 |
| 2082 | 6.167E+04 | 3.369E+07 | 6.784E+04 | 2.331E+02 | 6.502E+04 | 2.564E+02 |
| 2083 | 6.045E+04 | 3.302E+07 | 6.649E+04 | 2.285E+02 | 6.373E+04 | 2.513E+02 |
| 2084 | 5.925E+04 | 3.237E+07 | 6.518E+04 | 2.239E+02 | 6.247E+04 | 2.463E+02 |
| 2085 | 5.808E+04 | 3.173E+07 | 6.389E+04 | 2.195E+02 | 6.124E+04 | 2.414E+02 |
| 2086 | 5.693E+04 | 3.110E+07 | 6.262E+04 | 2.152E+02 | 6.002E+04 | 2.367E+02 |
| 2087 | 5.580E+04 | 3.048E+07 | 6.138E+04 | 2.109E+02 | 5.883E+04 | 2.320E+02 |
| 2088 | 5.470E+04 | 2.988E+07 | 6.017E+04 | 2.067E+02 | 5.767E+04 | 2.274E+02 |
| 2089 | 5.361E+04 | 2.929E+07 | 5.897E+04 | 2.026E+02 | 5.653E+04 | 2.229E+02 |
| 2090 | 5.255E+04 | 2.871E+07 | 5.781E+04 | 1.986E+02 | 5.541E+04 | 2.185E+02 |
| 2091 | 5.151E+04 | 2.814E+07 | 5.666E+04 | 1.947E+02 | 5.431E+04 | 2.141E+02 |
| 2092 | 5.049E+04 | 2.758E+07 | 5.554E+04 | 1.908E+02 | 5.324E+04 | 2.099E+02 |
| 2093 | 4.949E+04 | 2.704E+07 | 5.444E+04 | 1.870E+02 | 5.218E+04 | 2.057E+02 |
| 2094 | 4.851E+04 | 2.650E+07 | 5.336E+04 | 1.833E+02 | 5.115E+04 | 2.017E+02 |
| 2095 | 4.755E+04 | 2.598E+07 | 5.231E+04 | 1.797E+02 | 5.014E+04 | 1.977E+02 |
| 2096 | 4.661E+04 | 2.546E+07 | 5.127E+04 | 1.762E+02 | 4.914E+04 | 1.938E+02 |
| 2097 | 4.569E+04 | 2.496E+07 | 5.026E+04 | 1.727E+02 | 4.817E+04 | 1.899E+02 |
| 2098 | 4.478E+04 | 2.446E+07 | 4.926E+04 | 1.692E+02 | 4.722E+04 | 1.862E+02 |
| 2099 | 4.390E+04 | 2.398E+07 | 4.828E+04 | 1.659E+02 | 4.628E+04 | 1.825E+02 |
| 2100 | 4.303E+04 | 2.350E+07 | 4.733E+04 | 1.626E+02 | 4.536E+04 | 1.789E+02 |
| 2101 | 4.217E+04 | 2.304E+07 | 4.639E+04 | 1.594E+02 | 4.447E+04 | 1.753E+02 |
| 2102 | 4.134E+04 | 2.258E+07 | 4.547E+04 | 1.562E+02 | 4.359E+04 | 1.719E+02 |
| 2103 | 4.052E+04 | 2.214E+07 | 4.457E+04 | 1.531E+02 | 4.272E+04 | 1.685E+02 |
| 2104 | 3.972E+04 | 2.170E+07 | 4.369E+04 | 1.501E+02 | 4.188E+04 | 1.651E+02 |
| 2105 | 3.893E+04 | 2.127E+07 | 4.282E+04 | 1.471E+02 | 4.105E+04 | 1.618E+02 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2106 | 3.816E+04 | 2.085E+07 | 4.198E+04 | 1.442E+02 | 4.023E+04 | 1.586E+02 |
| 2107 | 3.740E+04 | 2.043E+07 | 4.115E+04 | 1.414E+02 | 3.944E+04 | 1.555E+02 |
| 2108 | 3.666E+04 | 2.003E+07 | 4.033E+04 | 1.386E+02 | 3.866E+04 | 1.524E+02 |
| 2109 | 3.594E+04 | 1.963E+07 | 3.953E+04 | 1.358E+02 | 3.789E+04 | 1.494E+02 |
| 2110 | 3.523E+04 | 1.924E+07 | 3.875E+04 | 1.331E+02 | 3.714E+04 | 1.464E+02 |
| 2111 | 3.453E+04 | 1.886E+07 | 3.798E+04 | 1.305E+02 | 3.641E+04 | 1.435E+02 |
| 2112 | 3.385E+04 | 1.849E+07 | 3.723E+04 | 1.279E+02 | 3.569E+04 | 1.407E+02 |
| 2113 | 3.318E+04 | 1.812E+07 | 3.649E+04 | 1.254E+02 | 3.498E+04 | 1.379E+02 |
| 2114 | 3.252E+04 | 1.776E+07 | 3.577E+04 | 1.229E+02 | 3.429E+04 | 1.352E+02 |
| 2115 | 3.187E+04 | 1.741E+07 | 3.506E+04 | 1.205E+02 | 3.361E+04 | 1.325E+02 |
| 2116 | 3.124E+04 | 1.707E+07 | 3.437E+04 | 1.181E+02 | 3.294E+04 | 1.299E+02 |
| 2117 | 3.062E+04 | 1.673E+07 | 3.369E+04 | 1.157E+02 | 3.229E+04 | 1.273E+02 |
| 2118 | 3.002E+04 | 1.640E+07 | 3.302E+04 | 1.134E+02 | 3.165E+04 | 1.248E+02 |
| 2119 | 2.942E+04 | 1.607E+07 | 3.237E+04 | 1.112E+02 | 3.102E+04 | 1.223E+02 |
| 2120 | 2.884E+04 | 1.576E+07 | 3.173E+04 | 1.090E+02 | 3.041E+04 | 1.199E+02 |
| 2121 | 2.827E+04 | 1.544E+07 | 3.110E+04 | 1.068E+02 | 2.981E+04 | 1.175E+02 |
| 2122 | 2.771E+04 | 1.514E+07 | 3.048E+04 | 1.047E+02 | 2.922E+04 | 1.152E+02 |
| 2123 | 2.716E+04 | 1.484E+07 | 2.988E+04 | 1.027E+02 | 2.864E+04 | 1.129E+02 |
| 2124 | 2.662E+04 | 1.454E+07 | 2.929E+04 | 1.006E+02 | 2.807E+04 | 1.107E+02 |
| 2125 | 2.610E+04 | 1.426E+07 | 2.871E+04 | 9.863E+01 | 2.752E+04 | 1.085E+02 |
| 2126 | 2.558E+04 | 1.397E+07 | 2.814E+04 | 9.667E+01 | 2.697E+04 | 1.063E+02 |
| 2127 | 2.507E+04 | 1.370E+07 | 2.758E+04 | 9.476E+01 | 2.644E+04 | 1.042E+02 |
| 2128 | 2.458E+04 | 1.343E+07 | 2.703E+04 | 9.288E+01 | 2.591E+04 | 1.022E+02 |
| 2129 | 2.409E+04 | 1.316E+07 | 2.650E+04 | 9.104E+01 | 2.540E+04 | 1.001E+02 |
| 2130 | 2.361E+04 | 1.290E+07 | 2.597E+04 | 8.924E+01 | 2.490E+04 | 9.817E+01 |
| 2131 | 2.315E+04 | 1.264E+07 | 2.546E+04 | 8.747E+01 | 2.440E+04 | 9.622E+01 |
| 2132 | 2.269E+04 | 1.239E+07 | 2.496E+04 | 8.574E+01 | 2.392E+04 | 9.432E+01 |
| 2133 | 2.224E+04 | 1.215E+07 | 2.446E+04 | 8.404E+01 | 2.345E+04 | 9.245E+01 |
| 2134 | 2.180E+04 | 1.191E+07 | 2.398E+04 | 8.238E+01 | 2.298E+04 | 9.062E+01 |
| 2135 | 2.137E+04 | 1.167E+07 | 2.350E+04 | 8.075E+01 | 2.253E+04 | 8.882E+01 |
| 2136 | 2.094E+04 | 1.144E+07 | 2.304E+04 | 7.915E+01 | 2.208E+04 | 8.706E+01 |
| 2137 | 2.053E+04 | 1.121E+07 | 2.258E+04 | 7.758E+01 | 2.164E+04 | 8.534E+01 |
| 2138 | 2.012E+04 | 1.099E+07 | 2.213E+04 | 7.605E+01 | 2.122E+04 | 8.365E+01 |
| 2139 | 1.972E+04 | 1.077E+07 | 2.170E+04 | 7.454E+01 | 2.080E+04 | 8.199E+01 |
| 2140 | 1.933E+04 | 1.056E+07 | 2.127E+04 | 7.306E+01 | 2.038E+04 | 8.037E+01 |
| 2141 | 1.895E+04 | 1.035E+07 | 2.084E+04 | 7.162E+01 | 1.998E+04 | 7.878E+01 |
| 2142 | 1.857E+04 | 1.015E+07 | 2.043E+04 | 7.020E+01 | 1.958E+04 | 7.722E+01 |
| 2143 | 1.821E+04 | 9.946E+06 | 2.003E+04 | 6.881E+01 | 1.920E+04 | 7.569E+01 |
| 2144 | 1.785E+04 | 9.749E+06 | 1.963E+04 | 6.745E+01 | 1.882E+04 | 7.419E+01 |
| 2145 | 1.749E+04 | 9.556E+06 | 1.924E+04 | 6.611E+01 | 1.844E+04 | 7.272E+01 |

# AP-42 (Inventory) LandGEM for Maximum Potential Emissions

# (Using Default NSPS NMOC concentration)

# Summary Report

**Landfill Name or Identifier:** Tekoi Landfill, Utah

**Date:** Monday, March 21, 2016

**Description/Comments:**

**About LandGEM:**

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} k L_o \left( \frac{M_i}{10} \right) e^{-k t_{ij}}$$

Where,

$Q_{CH4}$ = annual methane generation in the year of the calculation (*$m^3$/year*)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate (*$year^{-1}$*)
$L_o$ = potential methane generation capacity (*$m^3$/Mg*)

$M_i$ = mass of waste accepted in the $i^{th}$ year (*Mg*)
$t_{ij}$ = age of the $j^{th}$ section of waste mass $M_i$ accepted in the $i^{th}$ year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

## Input Review

LANDFILL CHARACTERISTICS

| | | |
|---|---|---|
| Landfill Open Year | **2005** | |
| Landfill Closure Year (with 80-year limit) | **2052** | |
| *Actual Closure Year (without limit)* | ***2052*** | |
| Have Model Calculate Closure Year? | **Yes** | |
| Waste Design Capacity | **47,939,986** | *short tons* |

MODEL PARAMETERS

| | | |
|---|---|---|
| Methane Generation Rate, k | **0.020** | *year $^{-1}$* |
| Potential Methane Generation Capacity, $L_o$ | **100** | *$m^3$/Mg* |
| NMOC Concentration | **4,000** | *ppmv as hexane* |
| Methane Content | **50** | *% by volume* |

GASES / POLLUTANTS SELECTED

| | |
|---|---|
| Gas / Pollutant #1: | **Total landfill gas** |
| Gas / Pollutant #2: | **Methane** |
| Gas / Pollutant #3: | **Carbon dioxide** |
| Gas / Pollutant #4: | **NMOC** |

WASTE ACCEPTANCE RATES

| Year | Waste Accepted | | Waste-In-Place | |
|---|---|---|---|---|
| | *(Mg/year)* | *(short tons/year)* | *(Mg)* | *(short tons)* |
| 2005 | 140,242 | 154,266 | 0 | 0 |
| 2006 | 268,131 | 294,944 | 140,242 | 154,266 |
| 2007 | 264,525 | 290,978 | 408,373 | 449,210 |
| 2008 | 192,975 | 212,273 | 672,898 | 740,188 |
| 2009 | 185,518 | 204,070 | 865,874 | 952,461 |
| 2010 | 170,159 | 187,175 | 1,051,392 | 1,156,531 |
| 2011 | 183,426 | 201,769 | 1,221,551 | 1,343,706 |
| 2012 | 172,854 | 190,140 | 1,404,977 | 1,545,475 |
| 2013 | 169,091 | 186,000 | 1,577,832 | 1,735,615 |
| 2014 | 196,194 | 215,814 | 1,746,922 | 1,921,615 |
| 2015 | 174,515 | 191,967 | 1,943,117 | 2,137,428 |
| 2016 | 1,134,545 | 1,248,000 | 2,117,632 | 2,329,395 |
| 2017 | 1,134,545 | 1,248,000 | 3,252,178 | 3,577,395 |
| 2018 | 1,134,545 | 1,248,000 | 4,386,723 | 4,825,395 |
| 2019 | 1,134,545 | 1,248,000 | 5,521,268 | 6,073,395 |
| 2020 | 1,134,545 | 1,248,000 | 6,655,814 | 7,321,395 |
| 2021 | 1,134,545 | 1,248,000 | 7,790,359 | 8,569,395 |
| 2022 | 1,134,545 | 1,248,000 | 8,924,905 | 9,817,395 |
| 2023 | 1,134,545 | 1,248,000 | 10,059,450 | 11,065,395 |
| 2024 | 1,134,545 | 1,248,000 | 11,193,996 | 12,313,395 |
| 2025 | 1,134,545 | 1,248,000 | 12,328,541 | 13,561,395 |
| 2026 | 1,134,545 | 1,248,000 | 13,463,087 | 14,809,395 |
| 2027 | 1,134,545 | 1,248,000 | 14,597,632 | 16,057,395 |
| 2028 | 1,134,545 | 1,248,000 | 15,732,178 | 17,305,395 |
| 2029 | 1,134,545 | 1,248,000 | 16,866,723 | 18,553,395 |
| 2030 | 1,134,545 | 1,248,000 | 18,001,268 | 19,801,395 |
| 2031 | 1,134,545 | 1,248,000 | 19,135,814 | 21,049,395 |
| 2032 | 1,134,545 | 1,248,000 | 20,270,359 | 22,297,395 |
| 2033 | 1,134,545 | 1,248,000 | 21,404,905 | 23,545,395 |
| 2034 | 1,134,545 | 1,248,000 | 22,539,450 | 24,793,395 |
| 2035 | 1,134,545 | 1,248,000 | 23,673,996 | 26,041,395 |
| 2036 | 1,134,545 | 1,248,000 | 24,808,541 | 27,289,395 |
| 2037 | 1,134,545 | 1,248,000 | 25,943,087 | 28,537,395 |
| 2038 | 1,134,545 | 1,248,000 | 27,077,632 | 29,785,395 |
| 2039 | 1,134,545 | 1,248,000 | 28,212,178 | 31,033,395 |
| 2040 | 1,134,545 | 1,248,000 | 29,346,723 | 32,281,395 |
| 2041 | 1,134,545 | 1,248,000 | 30,481,268 | 33,529,395 |
| 2042 | 1,134,545 | 1,248,000 | 31,615,814 | 34,777,395 |
| 2043 | 1,134,545 | 1,248,000 | 32,750,359 | 36,025,395 |
| 2044 | 1,134,545 | 1,248,000 | 33,884,905 | 37,273,395 |

WASTE ACCEPTANCE RATES (Continued)

| Year | Waste Accepted | | Waste-In-Place | |
|---|---|---|---|---|
| | *(Mg/year)* | *(short tons/year)* | *(Mg)* | *(short tons)* |
| 2045 | 1,134,545 | 1,248,000 | 35,019,450 | 38,521,395 |
| 2046 | 1,134,545 | 1,248,000 | 36,153,996 | 39,769,395 |
| 2047 | 1,134,545 | 1,248,000 | 37,288,541 | 41,017,395 |
| 2048 | 1,134,545 | 1,248,000 | 38,423,087 | 42,265,395 |
| 2049 | 1,134,545 | 1,248,000 | 39,557,632 | 43,513,395 |
| 2050 | 1,134,545 | 1,248,000 | 40,692,178 | 44,761,395 |
| 2051 | 1,134,545 | 1,248,000 | 41,826,723 | 46,009,395 |
| 2052 | 620,537 | 682,591 | 42,961,268 | 47,257,395 |
| 2053 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2054 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2055 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2056 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2057 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2058 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2059 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2060 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2061 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2062 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2063 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2064 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2065 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2066 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2067 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2068 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2069 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2070 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2071 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2072 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2073 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2074 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2075 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2076 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2077 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2078 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2079 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2080 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2081 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2082 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2083 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2084 | 0 | 0 | 43,581,805 | 47,939,986 |

## Pollutant Parameters

| | | Gas / Pollutant Default Parameters: | | User-specified Pollutant Parameters: | |
|---|---|---|---|---|---|
| | Compound | Concentration (*ppmv*) | Molecular Weight | Concentration (*ppmv*) | Molecular Weight |
| Gases | Total landfill gas | | 0.00 | | |
| | Methane | | 16.04 | | |
| | Carbon dioxide | | 44.01 | | |
| | NMOC | 4,000 | 86.18 | | |
| Pollutants | 1,1,1-Trichloroethane (methyl chloroform) - HAP | 0.48 | 133.41 | | |
| | 1,1,2,2-Tetrachloroethane - HAP/VOC | 1.1 | 167.85 | | |
| | 1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC | 2.4 | 98.97 | | |
| | 1,1-Dichloroethene (vinylidene chloride) - HAP/VOC | 0.20 | 96.94 | | |
| | 1,2-Dichloroethane (ethylene dichloride) - HAP/VOC | 0.41 | 98.96 | | |
| | 1,2-Dichloropropane (propylene dichloride) - HAP/VOC | 0.18 | 112.99 | | |
| | 2-Propanol (isopropyl alcohol) - VOC | 50 | 60.11 | | |
| | Acetone | 7.0 | 58.08 | | |
| | Acrylonitrile - HAP/VOC | 6.3 | 53.06 | | |
| | Benzene - No or Unknown Co-disposal - HAP/VOC | 1.9 | 78.11 | | |
| | Benzene - Co-disposal - HAP/VOC | 11 | 78.11 | | |
| | Bromodichloromethane - VOC | 3.1 | 163.83 | | |
| | Butane - VOC | 5.0 | 58.12 | | |
| | Carbon disulfide - HAP/VOC | 0.58 | 76.13 | | |
| | Carbon monoxide | 140 | 28.01 | | |
| | Carbon tetrachloride - HAP/VOC | 4.0E-03 | 153.84 | | |
| | Carbonyl sulfide - HAP/VOC | 0.49 | 60.07 | | |
| | Chlorobenzene - HAP/VOC | 0.25 | 112.56 | | |
| | Chlorodifluoromethane | 1.3 | 86.47 | | |
| | Chloroethane (ethyl chloride) - HAP/VOC | 1.3 | 64.52 | | |
| | Chloroform - HAP/VOC | 0.03 | 119.39 | | |
| | Chloromethane - VOC | 1.2 | 50.49 | | |
| | Dichlorobenzene - (HAP for para isomer/VOC) | 0.21 | 147 | | |
| | Dichlorodifluoromethane | 16 | 120.91 | | |
| | Dichlorofluoromethane - VOC | 2.6 | 102.92 | | |
| | Dichloromethane (methylene chloride) - HAP | 14 | 84.94 | | |
| | Dimethyl sulfide (methyl sulfide) - VOC | 7.8 | 62.13 | | |
| | Ethane | 890 | 30.07 | | |
| | Ethanol - VOC | 27 | 46.08 | | |

## Pollutant Parameters (Continued)

| | Gas / Pollutant Default Parameters: | | | User-specified Pollutant Parameters: | |
|---|---|---|---|---|---|
| | Compound | Concentration (*ppmv*) | Molecular Weight | Concentration (*ppmv*) | Molecular Weight |
| Pollutants | Ethyl mercaptan (ethanethiol) - VOC | 2.3 | 62.13 | | |
| | Ethylbenzene - HAP/VOC | 4.6 | 106.16 | | |
| | Ethylene dibromide - HAP/VOC | 1.0E-03 | 187.88 | | |
| | Fluorotrichloromethane - VOC | 0.76 | 137.38 | | |
| | Hexane - HAP/VOC | 6.6 | 86.18 | | |
| | Hydrogen sulfide | 36 | 34.08 | | |
| | Mercury (total) - HAP | 2.9E-04 | 200.61 | | |
| | Methyl ethyl ketone - HAP/VOC | 7.1 | 72.11 | | |
| | Methyl isobutyl ketone - HAP/VOC | 1.9 | 100.16 | | |
| | Methyl mercaptan - VOC | 2.5 | 48.11 | | |
| | Pentane - VOC | 3.3 | 72.15 | | |
| | Perchloroethylene (tetrachloroethylene) - HAP | 3.7 | 165.83 | | |
| | Propane - VOC | 11 | 44.09 | | |
| | t-1,2-Dichloroethene - VOC | 2.8 | 96.94 | | |
| | Toluene - No or Unknown Co-disposal - HAP/VOC | 39 | 92.13 | | |
| | Toluene - Co-disposal - HAP/VOC | 170 | 92.13 | | |
| | Trichloroethylene (trichloroethene) - HAP/VOC | 2.8 | 131.40 | | |
| | Vinyl chloride - HAP/VOC | 7.3 | 62.50 | | |
| | Xylenes - HAP/VOC | 12 | 106.16 | | |
| | | | | | |
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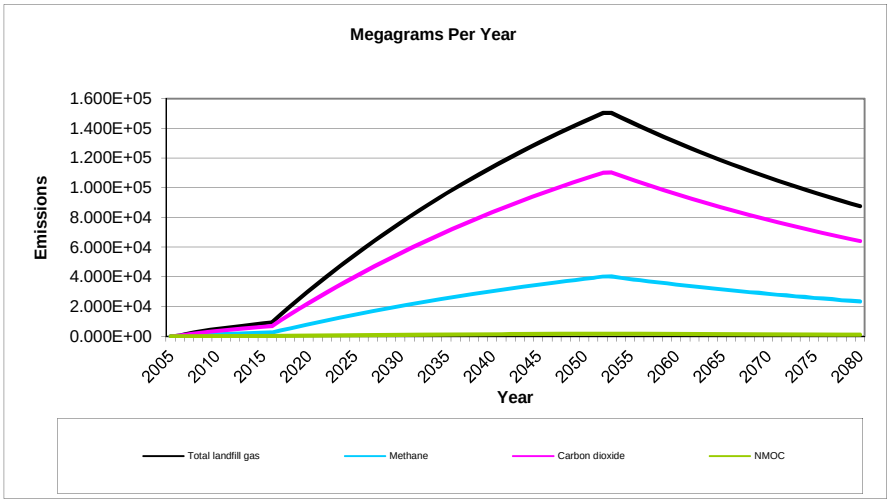
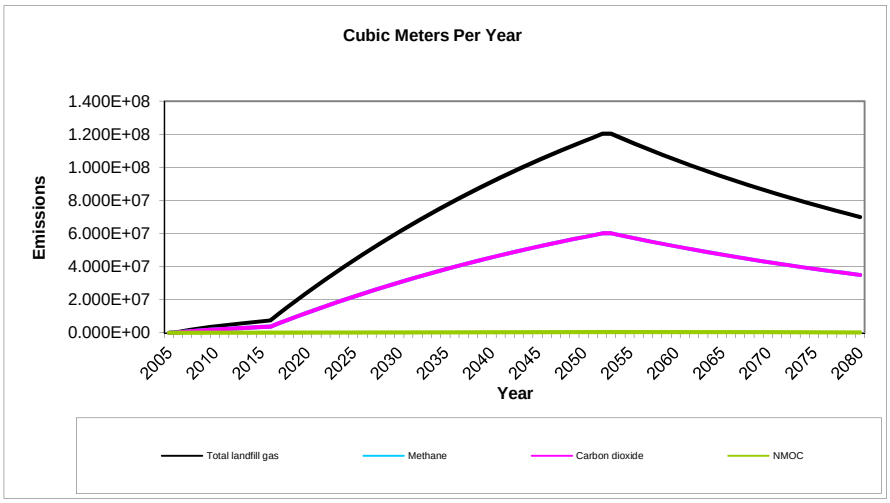
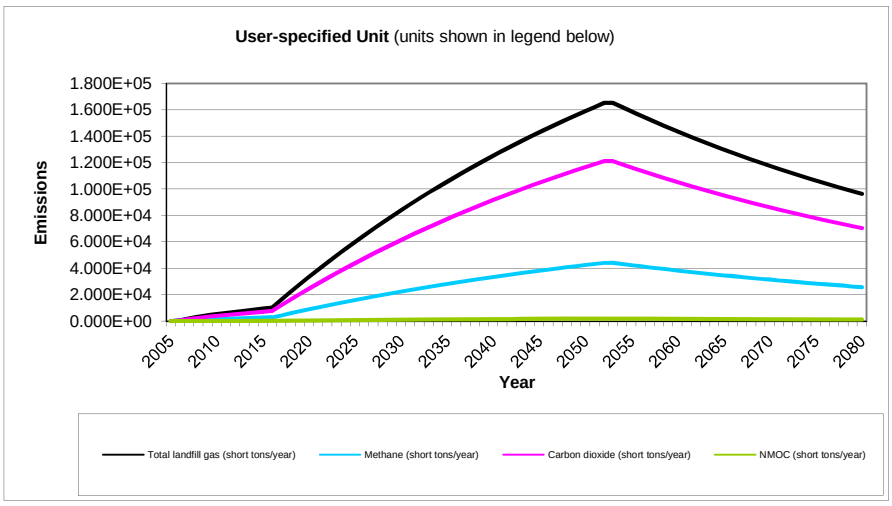
## Graphs


Megagrams Per Year
Emissions
1.600E+05
1.400E+05
1.200E+05
1.000E+05
8.000E+04
6.000E+04
4.000E+04
2.000E+04
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
1.400E+08
1.200E+08
1.000E+08
8.000E+07
6.000E+07
4.000E+07
2.000E+07
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
1.800E+05
1.600E+05
1.400E+05
1.200E+05
1.000E+05
8.000E+04
6.000E+04
4.000E+04
2.000E+04
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas (short tons/year)
Methane (short tons/year)
Carbon dioxide (short tons/year)
NMOC (short tons/year)

## Results

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 6.943E+02 | 5.560E+05 | 7.637E+02 | 1.855E+02 | 2.780E+05 | 2.040E+02 |
| 2007 | 2.008E+03 | 1.608E+06 | 2.209E+03 | 5.363E+02 | 8.039E+05 | 5.900E+02 |
| 2008 | 3.278E+03 | 2.625E+06 | 3.606E+03 | 8.755E+02 | 1.312E+06 | 9.631E+02 |
| 2009 | 4.168E+03 | 3.338E+06 | 4.585E+03 | 1.113E+03 | 1.669E+06 | 1.225E+03 |
| 2010 | 5.004E+03 | 4.007E+06 | 5.505E+03 | 1.337E+03 | 2.004E+06 | 1.470E+03 |
| 2011 | 5.747E+03 | 4.602E+06 | 6.322E+03 | 1.535E+03 | 2.301E+06 | 1.689E+03 |
| 2012 | 6.542E+03 | 5.238E+06 | 7.196E+03 | 1.747E+03 | 2.619E+06 | 1.922E+03 |
| 2013 | 7.268E+03 | 5.820E+06 | 7.995E+03 | 1.941E+03 | 2.910E+06 | 2.135E+03 |
| 2014 | 7.961E+03 | 6.375E+06 | 8.757E+03 | 2.126E+03 | 3.187E+06 | 2.339E+03 |
| 2015 | 8.775E+03 | 7.026E+06 | 9.652E+03 | 2.344E+03 | 3.513E+06 | 2.578E+03 |
| 2016 | 9.465E+03 | 7.579E+06 | 1.041E+04 | 2.528E+03 | 3.790E+06 | 2.781E+03 |
| 2017 | 1.489E+04 | 1.193E+07 | 1.638E+04 | 3.978E+03 | 5.963E+06 | 4.376E+03 |
| 2018 | 2.022E+04 | 1.619E+07 | 2.224E+04 | 5.400E+03 | 8.094E+06 | 5.940E+03 |
| 2019 | 2.543E+04 | 2.037E+07 | 2.798E+04 | 6.793E+03 | 1.018E+07 | 7.473E+03 |
| 2020 | 3.055E+04 | 2.446E+07 | 3.360E+04 | 8.159E+03 | 1.223E+07 | 8.975E+03 |
| 2021 | 3.556E+04 | 2.847E+07 | 3.911E+04 | 9.498E+03 | 1.424E+07 | 1.045E+04 |
| 2022 | 4.047E+04 | 3.241E+07 | 4.452E+04 | 1.081E+04 | 1.620E+07 | 1.189E+04 |
| 2023 | 4.529E+04 | 3.626E+07 | 4.981E+04 | 1.210E+04 | 1.813E+07 | 1.331E+04 |
| 2024 | 5.001E+04 | 4.004E+07 | 5.501E+04 | 1.336E+04 | 2.002E+07 | 1.469E+04 |
| 2025 | 5.463E+04 | 4.375E+07 | 6.010E+04 | 1.459E+04 | 2.187E+07 | 1.605E+04 |
| 2026 | 5.917E+04 | 4.738E+07 | 6.508E+04 | 1.580E+04 | 2.369E+07 | 1.738E+04 |
| 2027 | 6.361E+04 | 5.094E+07 | 6.997E+04 | 1.699E+04 | 2.547E+07 | 1.869E+04 |
| 2028 | 6.797E+04 | 5.443E+07 | 7.477E+04 | 1.816E+04 | 2.721E+07 | 1.997E+04 |
| 2029 | 7.224E+04 | 5.785E+07 | 7.946E+04 | 1.930E+04 | 2.892E+07 | 2.123E+04 |
| 2030 | 7.643E+04 | 6.120E+07 | 8.407E+04 | 2.041E+04 | 3.060E+07 | 2.246E+04 |
| 2031 | 8.053E+04 | 6.448E+07 | 8.858E+04 | 2.151E+04 | 3.224E+07 | 2.366E+04 |
| 2032 | 8.455E+04 | 6.770E+07 | 9.301E+04 | 2.258E+04 | 3.385E+07 | 2.484E+04 |
| 2033 | 8.849E+04 | 7.086E+07 | 9.734E+04 | 2.364E+04 | 3.543E+07 | 2.600E+04 |
| 2034 | 9.236E+04 | 7.396E+07 | 1.016E+05 | 2.467E+04 | 3.698E+07 | 2.714E+04 |
| 2035 | 9.615E+04 | 7.699E+07 | 1.058E+05 | 2.568E+04 | 3.849E+07 | 2.825E+04 |
| 2036 | 9.986E+04 | 7.996E+07 | 1.098E+05 | 2.667E+04 | 3.998E+07 | 2.934E+04 |
| 2037 | 1.035E+05 | 8.288E+07 | 1.138E+05 | 2.765E+04 | 4.144E+07 | 3.041E+04 |
| 2038 | 1.071E+05 | 8.573E+07 | 1.178E+05 | 2.860E+04 | 4.287E+07 | 3.146E+04 |
| 2039 | 1.106E+05 | 8.853E+07 | 1.216E+05 | 2.953E+04 | 4.427E+07 | 3.249E+04 |
| 2040 | 1.140E+05 | 9.128E+07 | 1.254E+05 | 3.045E+04 | 4.564E+07 | 3.349E+04 |
| 2041 | 1.173E+05 | 9.397E+07 | 1.291E+05 | 3.135E+04 | 4.698E+07 | 3.448E+04 |
| 2042 | 1.206E+05 | 9.660E+07 | 1.327E+05 | 3.222E+04 | 4.830E+07 | 3.545E+04 |
| 2043 | 1.239E+05 | 9.919E+07 | 1.363E+05 | 3.309E+04 | 4.959E+07 | 3.640E+04 |
| 2044 | 1.270E+05 | 1.017E+08 | 1.397E+05 | 3.393E+04 | 5.086E+07 | 3.733E+04 |
| 2045 | 1.301E+05 | 1.042E+08 | 1.431E+05 | 3.476E+04 | 5.210E+07 | 3.824E+04 |
| 2046 | 1.332E+05 | 1.066E+08 | 1.465E+05 | 3.557E+04 | 5.332E+07 | 3.913E+04 |
| 2047 | 1.362E+05 | 1.090E+08 | 1.498E+05 | 3.637E+04 | 5.451E+07 | 4.001E+04 |
| 2048 | 1.391E+05 | 1.114E+08 | 1.530E+05 | 3.715E+04 | 5.568E+07 | 4.086E+04 |
| 2049 | 1.419E+05 | 1.137E+08 | 1.561E+05 | 3.791E+04 | 5.683E+07 | 4.170E+04 |
| 2050 | 1.447E+05 | 1.159E+08 | 1.592E+05 | 3.866E+04 | 5.795E+07 | 4.253E+04 |
| 2051 | 1.475E+05 | 1.181E+08 | 1.622E+05 | 3.940E+04 | 5.905E+07 | 4.334E+04 |
| 2052 | 1.502E+05 | 1.203E+08 | 1.652E+05 | 4.012E+04 | 6.013E+07 | 4.413E+04 |
| 2053 | 1.503E+05 | 1.203E+08 | 1.653E+05 | 4.014E+04 | 6.017E+07 | 4.416E+04 |
| 2054 | 1.473E+05 | 1.180E+08 | 1.620E+05 | 3.935E+04 | 5.898E+07 | 4.328E+04 |

## Results (Continued)

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2055 | 1.444E+05 | 1.156E+08 | 1.588E+05 | 3.857E+04 | 5.781E+07 | 4.243E+04 |
| 2056 | 1.415E+05 | 1.133E+08 | 1.557E+05 | 3.781E+04 | 5.667E+07 | 4.159E+04 |
| 2057 | 1.387E+05 | 1.111E+08 | 1.526E+05 | 3.706E+04 | 5.555E+07 | 4.076E+04 |
| 2058 | 1.360E+05 | 1.089E+08 | 1.496E+05 | 3.632E+04 | 5.445E+07 | 3.996E+04 |
| 2059 | 1.333E+05 | 1.067E+08 | 1.466E+05 | 3.560E+04 | 5.337E+07 | 3.916E+04 |
| 2060 | 1.307E+05 | 1.046E+08 | 1.437E+05 | 3.490E+04 | 5.231E+07 | 3.839E+04 |
| 2061 | 1.281E+05 | 1.026E+08 | 1.409E+05 | 3.421E+04 | 5.128E+07 | 3.763E+04 |
| 2062 | 1.255E+05 | 1.005E+08 | 1.381E+05 | 3.353E+04 | 5.026E+07 | 3.688E+04 |
| 2063 | 1.230E+05 | 9.853E+07 | 1.354E+05 | 3.287E+04 | 4.926E+07 | 3.615E+04 |
| 2064 | 1.206E+05 | 9.658E+07 | 1.327E+05 | 3.222E+04 | 4.829E+07 | 3.544E+04 |
| 2065 | 1.182E+05 | 9.467E+07 | 1.300E+05 | 3.158E+04 | 4.733E+07 | 3.474E+04 |
| 2066 | 1.159E+05 | 9.279E+07 | 1.275E+05 | 3.095E+04 | 4.640E+07 | 3.405E+04 |
| 2067 | 1.136E+05 | 9.095E+07 | 1.249E+05 | 3.034E+04 | 4.548E+07 | 3.337E+04 |
| 2068 | 1.113E+05 | 8.915E+07 | 1.225E+05 | 2.974E+04 | 4.458E+07 | 3.271E+04 |
| 2069 | 1.091E+05 | 8.739E+07 | 1.200E+05 | 2.915E+04 | 4.369E+07 | 3.207E+04 |
| 2070 | 1.070E+05 | 8.566E+07 | 1.177E+05 | 2.857E+04 | 4.283E+07 | 3.143E+04 |
| 2071 | 1.049E+05 | 8.396E+07 | 1.153E+05 | 2.801E+04 | 4.198E+07 | 3.081E+04 |
| 2072 | 1.028E+05 | 8.230E+07 | 1.131E+05 | 2.745E+04 | 4.115E+07 | 3.020E+04 |
| 2073 | 1.007E+05 | 8.067E+07 | 1.108E+05 | 2.691E+04 | 4.033E+07 | 2.960E+04 |
| 2074 | 9.875E+04 | 7.907E+07 | 1.086E+05 | 2.638E+04 | 3.954E+07 | 2.901E+04 |
| 2075 | 9.679E+04 | 7.751E+07 | 1.065E+05 | 2.585E+04 | 3.875E+07 | 2.844E+04 |
| 2076 | 9.488E+04 | 7.597E+07 | 1.044E+05 | 2.534E+04 | 3.799E+07 | 2.788E+04 |
| 2077 | 9.300E+04 | 7.447E+07 | 1.023E+05 | 2.484E+04 | 3.723E+07 | 2.732E+04 |
| 2078 | 9.116E+04 | 7.299E+07 | 1.003E+05 | 2.435E+04 | 3.650E+07 | 2.678E+04 |
| 2079 | 8.935E+04 | 7.155E+07 | 9.829E+04 | 2.387E+04 | 3.577E+07 | 2.625E+04 |
| 2080 | 8.758E+04 | 7.013E+07 | 9.634E+04 | 2.339E+04 | 3.507E+07 | 2.573E+04 |
| 2081 | 8.585E+04 | 6.874E+07 | 9.443E+04 | 2.293E+04 | 3.437E+07 | 2.522E+04 |
| 2082 | 8.415E+04 | 6.738E+07 | 9.256E+04 | 2.248E+04 | 3.369E+07 | 2.472E+04 |
| 2083 | 8.248E+04 | 6.605E+07 | 9.073E+04 | 2.203E+04 | 3.302E+07 | 2.423E+04 |
| 2084 | 8.085E+04 | 6.474E+07 | 8.893E+04 | 2.160E+04 | 3.237E+07 | 2.375E+04 |
| 2085 | 7.925E+04 | 6.346E+07 | 8.717E+04 | 2.117E+04 | 3.173E+07 | 2.328E+04 |
| 2086 | 7.768E+04 | 6.220E+07 | 8.544E+04 | 2.075E+04 | 3.110E+07 | 2.282E+04 |
| 2087 | 7.614E+04 | 6.097E+07 | 8.375E+04 | 2.034E+04 | 3.048E+07 | 2.237E+04 |
| 2088 | 7.463E+04 | 5.976E+07 | 8.209E+04 | 1.993E+04 | 2.988E+07 | 2.193E+04 |
| 2089 | 7.315E+04 | 5.858E+07 | 8.047E+04 | 1.954E+04 | 2.929E+07 | 2.149E+04 |
| 2090 | 7.171E+04 | 5.742E+07 | 7.888E+04 | 1.915E+04 | 2.871E+07 | 2.107E+04 |
| 2091 | 7.029E+04 | 5.628E+07 | 7.731E+04 | 1.877E+04 | 2.814E+07 | 2.065E+04 |
| 2092 | 6.889E+04 | 5.517E+07 | 7.578E+04 | 1.840E+04 | 2.758E+07 | 2.024E+04 |
| 2093 | 6.753E+04 | 5.407E+07 | 7.428E+04 | 1.804E+04 | 2.704E+07 | 1.984E+04 |
| 2094 | 6.619E+04 | 5.300E+07 | 7.281E+04 | 1.768E+04 | 2.650E+07 | 1.945E+04 |
| 2095 | 6.488E+04 | 5.195E+07 | 7.137E+04 | 1.733E+04 | 2.598E+07 | 1.906E+04 |
| 2096 | 6.360E+04 | 5.093E+07 | 6.996E+04 | 1.699E+04 | 2.546E+07 | 1.869E+04 |
| 2097 | 6.234E+04 | 4.992E+07 | 6.857E+04 | 1.665E+04 | 2.496E+07 | 1.832E+04 |
| 2098 | 6.110E+04 | 4.893E+07 | 6.721E+04 | 1.632E+04 | 2.446E+07 | 1.795E+04 |
| 2099 | 5.989E+04 | 4.796E+07 | 6.588E+04 | 1.600E+04 | 2.398E+07 | 1.760E+04 |
| 2100 | 5.871E+04 | 4.701E+07 | 6.458E+04 | 1.568E+04 | 2.350E+07 | 1.725E+04 |
| 2101 | 5.754E+04 | 4.608E+07 | 6.330E+04 | 1.537E+04 | 2.304E+07 | 1.691E+04 |
| 2102 | 5.641E+04 | 4.517E+07 | 6.205E+04 | 1.507E+04 | 2.258E+07 | 1.657E+04 |
| 2103 | 5.529E+04 | 4.427E+07 | 6.082E+04 | 1.477E+04 | 2.214E+07 | 1.624E+04 |
| 2104 | 5.419E+04 | 4.340E+07 | 5.961E+04 | 1.448E+04 | 2.170E+07 | 1.592E+04 |
| 2105 | 5.312E+04 | 4.254E+07 | 5.843E+04 | 1.419E+04 | 2.127E+07 | 1.561E+04 |

## Results (Continued)

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2106 | 5.207E+04 | 4.169E+07 | 5.728E+04 | 1.391E+04 | 2.085E+07 | 1.530E+04 |
| 2107 | 5.104E+04 | 4.087E+07 | 5.614E+04 | 1.363E+04 | 2.043E+07 | 1.500E+04 |
| 2108 | 5.003E+04 | 4.006E+07 | 5.503E+04 | 1.336E+04 | 2.003E+07 | 1.470E+04 |
| 2109 | 4.904E+04 | 3.927E+07 | 5.394E+04 | 1.310E+04 | 1.963E+07 | 1.441E+04 |
| 2110 | 4.807E+04 | 3.849E+07 | 5.287E+04 | 1.284E+04 | 1.924E+07 | 1.412E+04 |
| 2111 | 4.711E+04 | 3.773E+07 | 5.182E+04 | 1.258E+04 | 1.886E+07 | 1.384E+04 |
| 2112 | 4.618E+04 | 3.698E+07 | 5.080E+04 | 1.234E+04 | 1.849E+07 | 1.357E+04 |
| 2113 | 4.527E+04 | 3.625E+07 | 4.979E+04 | 1.209E+04 | 1.812E+07 | 1.330E+04 |
| 2114 | 4.437E+04 | 3.553E+07 | 4.881E+04 | 1.185E+04 | 1.776E+07 | 1.304E+04 |
| 2115 | 4.349E+04 | 3.483E+07 | 4.784E+04 | 1.162E+04 | 1.741E+07 | 1.278E+04 |
| 2116 | 4.263E+04 | 3.414E+07 | 4.689E+04 | 1.139E+04 | 1.707E+07 | 1.253E+04 |
| 2117 | 4.179E+04 | 3.346E+07 | 4.596E+04 | 1.116E+04 | 1.673E+07 | 1.228E+04 |
| 2118 | 4.096E+04 | 3.280E+07 | 4.505E+04 | 1.094E+04 | 1.640E+07 | 1.203E+04 |
| 2119 | 4.015E+04 | 3.215E+07 | 4.416E+04 | 1.072E+04 | 1.607E+07 | 1.180E+04 |
| 2120 | 3.935E+04 | 3.151E+07 | 4.329E+04 | 1.051E+04 | 1.576E+07 | 1.156E+04 |
| 2121 | 3.857E+04 | 3.089E+07 | 4.243E+04 | 1.030E+04 | 1.544E+07 | 1.133E+04 |
| 2122 | 3.781E+04 | 3.028E+07 | 4.159E+04 | 1.010E+04 | 1.514E+07 | 1.111E+04 |
| 2123 | 3.706E+04 | 2.968E+07 | 4.077E+04 | 9.899E+03 | 1.484E+07 | 1.089E+04 |
| 2124 | 3.633E+04 | 2.909E+07 | 3.996E+04 | 9.703E+03 | 1.454E+07 | 1.067E+04 |
| 2125 | 3.561E+04 | 2.851E+07 | 3.917E+04 | 9.511E+03 | 1.426E+07 | 1.046E+04 |
| 2126 | 3.490E+04 | 2.795E+07 | 3.839E+04 | 9.323E+03 | 1.397E+07 | 1.026E+04 |
| 2127 | 3.421E+04 | 2.739E+07 | 3.763E+04 | 9.138E+03 | 1.370E+07 | 1.005E+04 |
| 2128 | 3.353E+04 | 2.685E+07 | 3.689E+04 | 8.957E+03 | 1.343E+07 | 9.853E+03 |
| 2129 | 3.287E+04 | 2.632E+07 | 3.616E+04 | 8.780E+03 | 1.316E+07 | 9.658E+03 |
| 2130 | 3.222E+04 | 2.580E+07 | 3.544E+04 | 8.606E+03 | 1.290E+07 | 9.467E+03 |
| 2131 | 3.158E+04 | 2.529E+07 | 3.474E+04 | 8.436E+03 | 1.264E+07 | 9.279E+03 |
| 2132 | 3.096E+04 | 2.479E+07 | 3.405E+04 | 8.269E+03 | 1.239E+07 | 9.096E+03 |
| 2133 | 3.034E+04 | 2.430E+07 | 3.338E+04 | 8.105E+03 | 1.215E+07 | 8.915E+03 |
| 2134 | 2.974E+04 | 2.382E+07 | 3.272E+04 | 7.944E+03 | 1.191E+07 | 8.739E+03 |
| 2135 | 2.915E+04 | 2.334E+07 | 3.207E+04 | 7.787E+03 | 1.167E+07 | 8.566E+03 |
| 2136 | 2.858E+04 | 2.288E+07 | 3.143E+04 | 7.633E+03 | 1.144E+07 | 8.396E+03 |
| 2137 | 2.801E+04 | 2.243E+07 | 3.081E+04 | 7.482E+03 | 1.121E+07 | 8.230E+03 |
| 2138 | 2.746E+04 | 2.198E+07 | 3.020E+04 | 7.334E+03 | 1.099E+07 | 8.067E+03 |
| 2139 | 2.691E+04 | 2.155E+07 | 2.960E+04 | 7.188E+03 | 1.077E+07 | 7.907E+03 |
| 2140 | 2.638E+04 | 2.112E+07 | 2.902E+04 | 7.046E+03 | 1.056E+07 | 7.751E+03 |
| 2141 | 2.586E+04 | 2.070E+07 | 2.844E+04 | 6.907E+03 | 1.035E+07 | 7.597E+03 |
| 2142 | 2.534E+04 | 2.029E+07 | 2.788E+04 | 6.770E+03 | 1.015E+07 | 7.447E+03 |
| 2143 | 2.484E+04 | 1.989E+07 | 2.733E+04 | 6.636E+03 | 9.946E+06 | 7.299E+03 |
| 2144 | 2.435E+04 | 1.950E+07 | 2.679E+04 | 6.504E+03 | 9.749E+06 | 7.155E+03 |
| 2145 | 2.387E+04 | 1.911E+07 | 2.626E+04 | 6.376E+03 | 9.556E+06 | 7.013E+03 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 5.088E+02 | 2.780E+05 | 5.597E+02 | 7.971E+00 | 2.224E+03 | 8.768E+00 |
| 2007 | 1.472E+03 | 8.039E+05 | 1.619E+03 | 2.305E+01 | 6.431E+03 | 2.536E+01 |
| 2008 | 2.402E+03 | 1.312E+06 | 2.642E+03 | 3.763E+01 | 1.050E+04 | 4.140E+01 |
| 2009 | 3.055E+03 | 1.669E+06 | 3.360E+03 | 4.786E+01 | 1.335E+04 | 5.264E+01 |
| 2010 | 3.667E+03 | 2.004E+06 | 4.034E+03 | 5.745E+01 | 1.603E+04 | 6.320E+01 |
| 2011 | 4.212E+03 | 2.301E+06 | 4.633E+03 | 6.599E+01 | 1.841E+04 | 7.259E+01 |
| 2012 | 4.794E+03 | 2.619E+06 | 5.274E+03 | 7.511E+01 | 2.095E+04 | 8.262E+01 |
| 2013 | 5.327E+03 | 2.910E+06 | 5.859E+03 | 8.344E+01 | 2.328E+04 | 9.179E+01 |
| 2014 | 5.835E+03 | 3.187E+06 | 6.418E+03 | 9.140E+01 | 2.550E+04 | 1.005E+02 |
| 2015 | 6.431E+03 | 3.513E+06 | 7.074E+03 | 1.007E+02 | 2.811E+04 | 1.108E+02 |
| 2016 | 6.937E+03 | 3.790E+06 | 7.630E+03 | 1.087E+02 | 3.032E+04 | 1.195E+02 |
| 2017 | 1.092E+04 | 5.963E+06 | 1.201E+04 | 1.710E+02 | 4.771E+04 | 1.881E+02 |
| 2018 | 1.482E+04 | 8.094E+06 | 1.630E+04 | 2.321E+02 | 6.475E+04 | 2.553E+02 |
| 2019 | 1.864E+04 | 1.018E+07 | 2.050E+04 | 2.920E+02 | 8.146E+04 | 3.212E+02 |
| 2020 | 2.239E+04 | 1.223E+07 | 2.463E+04 | 3.507E+02 | 9.784E+04 | 3.858E+02 |
| 2021 | 2.606E+04 | 1.424E+07 | 2.867E+04 | 4.082E+02 | 1.139E+05 | 4.491E+02 |
| 2022 | 2.966E+04 | 1.620E+07 | 3.263E+04 | 4.646E+02 | 1.296E+05 | 5.111E+02 |
| 2023 | 3.319E+04 | 1.813E+07 | 3.651E+04 | 5.199E+02 | 1.450E+05 | 5.719E+02 |
| 2024 | 3.665E+04 | 2.002E+07 | 4.031E+04 | 5.741E+02 | 1.602E+05 | 6.315E+02 |
| 2025 | 4.004E+04 | 2.187E+07 | 4.404E+04 | 6.272E+02 | 1.750E+05 | 6.900E+02 |
| 2026 | 4.336E+04 | 2.369E+07 | 4.770E+04 | 6.793E+02 | 1.895E+05 | 7.472E+02 |
| 2027 | 4.662E+04 | 2.547E+07 | 5.128E+04 | 7.303E+02 | 2.037E+05 | 8.034E+02 |
| 2028 | 4.981E+04 | 2.721E+07 | 5.480E+04 | 7.804E+02 | 2.177E+05 | 8.584E+02 |
| 2029 | 5.294E+04 | 2.892E+07 | 5.824E+04 | 8.294E+02 | 2.314E+05 | 9.123E+02 |
| 2030 | 5.601E+04 | 3.060E+07 | 6.161E+04 | 8.775E+02 | 2.448E+05 | 9.652E+02 |
| 2031 | 5.902E+04 | 3.224E+07 | 6.492E+04 | 9.246E+02 | 2.579E+05 | 1.017E+03 |
| 2032 | 6.197E+04 | 3.385E+07 | 6.816E+04 | 9.707E+02 | 2.708E+05 | 1.068E+03 |
| 2033 | 6.486E+04 | 3.543E+07 | 7.134E+04 | 1.016E+03 | 2.834E+05 | 1.118E+03 |
| 2034 | 6.769E+04 | 3.698E+07 | 7.446E+04 | 1.060E+03 | 2.958E+05 | 1.166E+03 |
| 2035 | 7.046E+04 | 3.849E+07 | 7.751E+04 | 1.104E+03 | 3.080E+05 | 1.214E+03 |
| 2036 | 7.319E+04 | 3.998E+07 | 8.050E+04 | 1.146E+03 | 3.199E+05 | 1.261E+03 |
| 2037 | 7.585E+04 | 4.144E+07 | 8.344E+04 | 1.188E+03 | 3.315E+05 | 1.307E+03 |
| 2038 | 7.847E+04 | 4.287E+07 | 8.631E+04 | 1.229E+03 | 3.429E+05 | 1.352E+03 |
| 2039 | 8.103E+04 | 4.427E+07 | 8.913E+04 | 1.269E+03 | 3.541E+05 | 1.396E+03 |
| 2040 | 8.354E+04 | 4.564E+07 | 9.190E+04 | 1.309E+03 | 3.651E+05 | 1.440E+03 |
| 2041 | 8.600E+04 | 4.698E+07 | 9.460E+04 | 1.347E+03 | 3.759E+05 | 1.482E+03 |
| 2042 | 8.842E+04 | 4.830E+07 | 9.726E+04 | 1.385E+03 | 3.864E+05 | 1.524E+03 |
| 2043 | 9.078E+04 | 4.959E+07 | 9.986E+04 | 1.422E+03 | 3.968E+05 | 1.564E+03 |
| 2044 | 9.310E+04 | 5.086E+07 | 1.024E+05 | 1.458E+03 | 4.069E+05 | 1.604E+03 |
| 2045 | 9.537E+04 | 5.210E+07 | 1.049E+05 | 1.494E+03 | 4.168E+05 | 1.644E+03 |
| 2046 | 9.760E+04 | 5.332E+07 | 1.074E+05 | 1.529E+03 | 4.266E+05 | 1.682E+03 |
| 2047 | 9.979E+04 | 5.451E+07 | 1.098E+05 | 1.563E+03 | 4.361E+05 | 1.720E+03 |
| 2048 | 1.019E+05 | 5.568E+07 | 1.121E+05 | 1.597E+03 | 4.455E+05 | 1.756E+03 |
| 2049 | 1.040E+05 | 5.683E+07 | 1.144E+05 | 1.630E+03 | 4.546E+05 | 1.793E+03 |
| 2050 | 1.061E+05 | 5.795E+07 | 1.167E+05 | 1.662E+03 | 4.636E+05 | 1.828E+03 |
| 2051 | 1.081E+05 | 5.905E+07 | 1.189E+05 | 1.693E+03 | 4.724E+05 | 1.863E+03 |
| 2052 | 1.101E+05 | 6.013E+07 | 1.211E+05 | 1.724E+03 | 4.811E+05 | 1.897E+03 |
| 2053 | 1.101E+05 | 6.017E+07 | 1.212E+05 | 1.725E+03 | 4.814E+05 | 1.898E+03 |
| 2054 | 1.080E+05 | 5.898E+07 | 1.188E+05 | 1.691E+03 | 4.718E+05 | 1.860E+03 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2055 | 1.058E+05 | 5.781E+07 | 1.164E+05 | 1.658E+03 | 4.625E+05 | 1.824E+03 |
| 2056 | 1.037E+05 | 5.667E+07 | 1.141E+05 | 1.625E+03 | 4.533E+05 | 1.788E+03 |
| 2057 | 1.017E+05 | 5.555E+07 | 1.118E+05 | 1.593E+03 | 4.444E+05 | 1.752E+03 |
| 2058 | 9.966E+04 | 5.445E+07 | 1.096E+05 | 1.561E+03 | 4.356E+05 | 1.717E+03 |
| 2059 | 9.769E+04 | 5.337E+07 | 1.075E+05 | 1.530E+03 | 4.269E+05 | 1.683E+03 |
| 2060 | 9.576E+04 | 5.231E+07 | 1.053E+05 | 1.500E+03 | 4.185E+05 | 1.650E+03 |
| 2061 | 9.386E+04 | 5.128E+07 | 1.032E+05 | 1.470E+03 | 4.102E+05 | 1.617E+03 |
| 2062 | 9.200E+04 | 5.026E+07 | 1.012E+05 | 1.441E+03 | 4.021E+05 | 1.585E+03 |
| 2063 | 9.018E+04 | 4.926E+07 | 9.920E+04 | 1.413E+03 | 3.941E+05 | 1.554E+03 |
| 2064 | 8.839E+04 | 4.829E+07 | 9.723E+04 | 1.385E+03 | 3.863E+05 | 1.523E+03 |
| 2065 | 8.664E+04 | 4.733E+07 | 9.531E+04 | 1.357E+03 | 3.787E+05 | 1.493E+03 |
| 2066 | 8.493E+04 | 4.640E+07 | 9.342E+04 | 1.330E+03 | 3.712E+05 | 1.463E+03 |
| 2067 | 8.325E+04 | 4.548E+07 | 9.157E+04 | 1.304E+03 | 3.638E+05 | 1.435E+03 |
| 2068 | 8.160E+04 | 4.458E+07 | 8.976E+04 | 1.278E+03 | 3.566E+05 | 1.406E+03 |
| 2069 | 7.998E+04 | 4.369E+07 | 8.798E+04 | 1.253E+03 | 3.496E+05 | 1.378E+03 |
| 2070 | 7.840E+04 | 4.283E+07 | 8.624E+04 | 1.228E+03 | 3.426E+05 | 1.351E+03 |
| 2071 | 7.685E+04 | 4.198E+07 | 8.453E+04 | 1.204E+03 | 3.358E+05 | 1.324E+03 |
| 2072 | 7.532E+04 | 4.115E+07 | 8.286E+04 | 1.180E+03 | 3.292E+05 | 1.298E+03 |
| 2073 | 7.383E+04 | 4.033E+07 | 8.122E+04 | 1.157E+03 | 3.227E+05 | 1.272E+03 |
| 2074 | 7.237E+04 | 3.954E+07 | 7.961E+04 | 1.134E+03 | 3.163E+05 | 1.247E+03 |
| 2075 | 7.094E+04 | 3.875E+07 | 7.803E+04 | 1.111E+03 | 3.100E+05 | 1.222E+03 |
| 2076 | 6.953E+04 | 3.799E+07 | 7.649E+04 | 1.089E+03 | 3.039E+05 | 1.198E+03 |
| 2077 | 6.816E+04 | 3.723E+07 | 7.497E+04 | 1.068E+03 | 2.979E+05 | 1.174E+03 |
| 2078 | 6.681E+04 | 3.650E+07 | 7.349E+04 | 1.047E+03 | 2.920E+05 | 1.151E+03 |
| 2079 | 6.548E+04 | 3.577E+07 | 7.203E+04 | 1.026E+03 | 2.862E+05 | 1.128E+03 |
| 2080 | 6.419E+04 | 3.507E+07 | 7.061E+04 | 1.006E+03 | 2.805E+05 | 1.106E+03 |
| 2081 | 6.292E+04 | 3.437E+07 | 6.921E+04 | 9.856E+02 | 2.750E+05 | 1.084E+03 |
| 2082 | 6.167E+04 | 3.369E+07 | 6.784E+04 | 9.661E+02 | 2.695E+05 | 1.063E+03 |
| 2083 | 6.045E+04 | 3.302E+07 | 6.649E+04 | 9.470E+02 | 2.642E+05 | 1.042E+03 |
| 2084 | 5.925E+04 | 3.237E+07 | 6.518E+04 | 9.282E+02 | 2.590E+05 | 1.021E+03 |
| 2085 | 5.808E+04 | 3.173E+07 | 6.389E+04 | 9.098E+02 | 2.538E+05 | 1.001E+03 |
| 2086 | 5.693E+04 | 3.110E+07 | 6.262E+04 | 8.918E+02 | 2.488E+05 | 9.810E+02 |
| 2087 | 5.580E+04 | 3.048E+07 | 6.138E+04 | 8.742E+02 | 2.439E+05 | 9.616E+02 |
| 2088 | 5.470E+04 | 2.988E+07 | 6.017E+04 | 8.569E+02 | 2.390E+05 | 9.425E+02 |
| 2089 | 5.361E+04 | 2.929E+07 | 5.897E+04 | 8.399E+02 | 2.343E+05 | 9.239E+02 |
| 2090 | 5.255E+04 | 2.871E+07 | 5.781E+04 | 8.233E+02 | 2.297E+05 | 9.056E+02 |
| 2091 | 5.151E+04 | 2.814E+07 | 5.666E+04 | 8.070E+02 | 2.251E+05 | 8.876E+02 |
| 2092 | 5.049E+04 | 2.758E+07 | 5.554E+04 | 7.910E+02 | 2.207E+05 | 8.701E+02 |
| 2093 | 4.949E+04 | 2.704E+07 | 5.444E+04 | 7.753E+02 | 2.163E+05 | 8.528E+02 |
| 2094 | 4.851E+04 | 2.650E+07 | 5.336E+04 | 7.600E+02 | 2.120E+05 | 8.360E+02 |
| 2095 | 4.755E+04 | 2.598E+07 | 5.231E+04 | 7.449E+02 | 2.078E+05 | 8.194E+02 |
| 2096 | 4.661E+04 | 2.546E+07 | 5.127E+04 | 7.302E+02 | 2.037E+05 | 8.032E+02 |
| 2097 | 4.569E+04 | 2.496E+07 | 5.026E+04 | 7.157E+02 | 1.997E+05 | 7.873E+02 |
| 2098 | 4.478E+04 | 2.446E+07 | 4.926E+04 | 7.015E+02 | 1.957E+05 | 7.717E+02 |
| 2099 | 4.390E+04 | 2.398E+07 | 4.828E+04 | 6.876E+02 | 1.918E+05 | 7.564E+02 |
| 2100 | 4.303E+04 | 2.350E+07 | 4.733E+04 | 6.740E+02 | 1.880E+05 | 7.414E+02 |
| 2101 | 4.217E+04 | 2.304E+07 | 4.639E+04 | 6.607E+02 | 1.843E+05 | 7.267E+02 |
| 2102 | 4.134E+04 | 2.258E+07 | 4.547E+04 | 6.476E+02 | 1.807E+05 | 7.124E+02 |
| 2103 | 4.052E+04 | 2.214E+07 | 4.457E+04 | 6.348E+02 | 1.771E+05 | 6.982E+02 |
| 2104 | 3.972E+04 | 2.170E+07 | 4.369E+04 | 6.222E+02 | 1.736E+05 | 6.844E+02 |
| 2105 | 3.893E+04 | 2.127E+07 | 4.282E+04 | 6.099E+02 | 1.701E+05 | 6.709E+02 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* | *(Mg/year)* | *($m^3$/year)* | *(short tons/year)* |
| 2106 | 3.816E+04 | 2.085E+07 | 4.198E+04 | 5.978E+02 | 1.668E+05 | 6.576E+02 |
| 2107 | 3.740E+04 | 2.043E+07 | 4.115E+04 | 5.860E+02 | 1.635E+05 | 6.446E+02 |
| 2108 | 3.666E+04 | 2.003E+07 | 4.033E+04 | 5.744E+02 | 1.602E+05 | 6.318E+02 |
| 2109 | 3.594E+04 | 1.963E+07 | 3.953E+04 | 5.630E+02 | 1.571E+05 | 6.193E+02 |
| 2110 | 3.523E+04 | 1.924E+07 | 3.875E+04 | 5.518E+02 | 1.540E+05 | 6.070E+02 |
| 2111 | 3.453E+04 | 1.886E+07 | 3.798E+04 | 5.409E+02 | 1.509E+05 | 5.950E+02 |
| 2112 | 3.385E+04 | 1.849E+07 | 3.723E+04 | 5.302E+02 | 1.479E+05 | 5.832E+02 |
| 2113 | 3.318E+04 | 1.812E+07 | 3.649E+04 | 5.197E+02 | 1.450E+05 | 5.717E+02 |
| 2114 | 3.252E+04 | 1.776E+07 | 3.577E+04 | 5.094E+02 | 1.421E+05 | 5.604E+02 |
| 2115 | 3.187E+04 | 1.741E+07 | 3.506E+04 | 4.993E+02 | 1.393E+05 | 5.493E+02 |
| 2116 | 3.124E+04 | 1.707E+07 | 3.437E+04 | 4.894E+02 | 1.365E+05 | 5.384E+02 |
| 2117 | 3.062E+04 | 1.673E+07 | 3.369E+04 | 4.797E+02 | 1.338E+05 | 5.277E+02 |
| 2118 | 3.002E+04 | 1.640E+07 | 3.302E+04 | 4.702E+02 | 1.312E+05 | 5.173E+02 |
| 2119 | 2.942E+04 | 1.607E+07 | 3.237E+04 | 4.609E+02 | 1.286E+05 | 5.070E+02 |
| 2120 | 2.884E+04 | 1.576E+07 | 3.173E+04 | 4.518E+02 | 1.260E+05 | 4.970E+02 |
| 2121 | 2.827E+04 | 1.544E+07 | 3.110E+04 | 4.429E+02 | 1.236E+05 | 4.872E+02 |
| 2122 | 2.771E+04 | 1.514E+07 | 3.048E+04 | 4.341E+02 | 1.211E+05 | 4.775E+02 |
| 2123 | 2.716E+04 | 1.484E+07 | 2.988E+04 | 4.255E+02 | 1.187E+05 | 4.680E+02 |
| 2124 | 2.662E+04 | 1.454E+07 | 2.929E+04 | 4.171E+02 | 1.164E+05 | 4.588E+02 |
| 2125 | 2.610E+04 | 1.426E+07 | 2.871E+04 | 4.088E+02 | 1.141E+05 | 4.497E+02 |
| 2126 | 2.558E+04 | 1.397E+07 | 2.814E+04 | 4.007E+02 | 1.118E+05 | 4.408E+02 |
| 2127 | 2.507E+04 | 1.370E+07 | 2.758E+04 | 3.928E+02 | 1.096E+05 | 4.321E+02 |
| 2128 | 2.458E+04 | 1.343E+07 | 2.703E+04 | 3.850E+02 | 1.074E+05 | 4.235E+02 |
| 2129 | 2.409E+04 | 1.316E+07 | 2.650E+04 | 3.774E+02 | 1.053E+05 | 4.151E+02 |
| 2130 | 2.361E+04 | 1.290E+07 | 2.597E+04 | 3.699E+02 | 1.032E+05 | 4.069E+02 |
| 2131 | 2.315E+04 | 1.264E+07 | 2.546E+04 | 3.626E+02 | 1.012E+05 | 3.988E+02 |
| 2132 | 2.269E+04 | 1.239E+07 | 2.496E+04 | 3.554E+02 | 9.915E+04 | 3.909E+02 |
| 2133 | 2.224E+04 | 1.215E+07 | 2.446E+04 | 3.484E+02 | 9.719E+04 | 3.832E+02 |
| 2134 | 2.180E+04 | 1.191E+07 | 2.398E+04 | 3.415E+02 | 9.526E+04 | 3.756E+02 |
| 2135 | 2.137E+04 | 1.167E+07 | 2.350E+04 | 3.347E+02 | 9.338E+04 | 3.682E+02 |
| 2136 | 2.094E+04 | 1.144E+07 | 2.304E+04 | 3.281E+02 | 9.153E+04 | 3.609E+02 |
| 2137 | 2.053E+04 | 1.121E+07 | 2.258E+04 | 3.216E+02 | 8.972E+04 | 3.537E+02 |
| 2138 | 2.012E+04 | 1.099E+07 | 2.213E+04 | 3.152E+02 | 8.794E+04 | 3.467E+02 |
| 2139 | 1.972E+04 | 1.077E+07 | 2.170E+04 | 3.090E+02 | 8.620E+04 | 3.399E+02 |
| 2140 | 1.933E+04 | 1.056E+07 | 2.127E+04 | 3.029E+02 | 8.449E+04 | 3.331E+02 |
| 2141 | 1.895E+04 | 1.035E+07 | 2.084E+04 | 2.969E+02 | 8.282E+04 | 3.265E+02 |
| 2142 | 1.857E+04 | 1.015E+07 | 2.043E+04 | 2.910E+02 | 8.118E+04 | 3.201E+02 |
| 2143 | 1.821E+04 | 9.946E+06 | 2.003E+04 | 2.852E+02 | 7.957E+04 | 3.137E+02 |
| 2144 | 1.785E+04 | 9.749E+06 | 1.963E+04 | 2.796E+02 | 7.800E+04 | 3.075E+02 |
| 2145 | 1.749E+04 | 9.556E+06 | 1.924E+04 | 2.740E+02 | 7.645E+04 | 3.014E+02 |

# NSPS [Regulatory] LandGEM

# Summary Report

**Landfill Name or Identifier:** Tekoi Landfill, Utah

**Date:** Monday, March 21, 2016

**Description/Comments:**

**About LandGEM:**

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} k L_o \left( \frac{M_i}{10} \right) e^{-k t_{ij}}$$

Where,

$Q_{CH4}$ = annual methane generation in the year of the calculation (*$m^3$/year*)
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate (*$year^{-1}$*)
$L_o$ = potential methane generation capacity (*$m^3$/Mg*)

$M_i$ = mass of waste accepted in the $i^{th}$ year (*Mg*)
$t_{ij}$ = age of the $j^{th}$ section of waste mass $M_i$ accepted in the $i^{th}$ year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

## Input Review

LANDFILL CHARACTERISTICS

| | | |
|---|---|---|
| Landfill Open Year | **2005** | |
| Landfill Closure Year (with 80-year limit) | **2052** | |
| *Actual Closure Year (without limit)* | ***2052*** | |
| Have Model Calculate Closure Year? | **Yes** | |
| Waste Design Capacity | **47,939,986** | *short tons* |

MODEL PARAMETERS

| | | |
|---|---|---|
| Methane Generation Rate, k | **0.020** | *year $^{-1}$* |
| Potential Methane Generation Capacity, $L_o$ | **170** | *$m^3$/Mg* |
| NMOC Concentration | **965** | *ppmv as hexane* |
| Methane Content | **50** | *% by volume* |

GASES / POLLUTANTS SELECTED

| | |
|---|---|
| Gas / Pollutant #1: | **Total landfill gas** |
| Gas / Pollutant #2: | **Methane** |
| Gas / Pollutant #3: | **Carbon dioxide** |
| Gas / Pollutant #4: | **NMOC** |

WASTE ACCEPTANCE RATES

| Year | Waste Accepted | | Waste-In-Place | |
|---|---|---|---|---|
| | *(Mg/year)* | *(short tons/year)* | *(Mg)* | *(short tons)* |
| 2005 | 140,242 | 154,266 | 0 | 0 |
| 2006 | 268,131 | 294,944 | 140,242 | 154,266 |
| 2007 | 264,525 | 290,978 | 408,373 | 449,210 |
| 2008 | 192,975 | 212,273 | 672,898 | 740,188 |
| 2009 | 185,518 | 204,070 | 865,874 | 952,461 |
| 2010 | 170,159 | 187,175 | 1,051,392 | 1,156,531 |
| 2011 | 183,426 | 201,769 | 1,221,551 | 1,343,706 |
| 2012 | 172,854 | 190,140 | 1,404,977 | 1,545,475 |
| 2013 | 169,091 | 186,000 | 1,577,832 | 1,735,615 |
| 2014 | 196,194 | 215,814 | 1,746,922 | 1,921,615 |
| 2015 | 174,515 | 191,967 | 1,943,117 | 2,137,428 |
| 2016 | 1,134,545 | 1,248,000 | 2,117,632 | 2,329,395 |
| 2017 | 1,134,545 | 1,248,000 | 3,252,178 | 3,577,395 |
| 2018 | 1,134,545 | 1,248,000 | 4,386,723 | 4,825,395 |
| 2019 | 1,134,545 | 1,248,000 | 5,521,268 | 6,073,395 |
| 2020 | 1,134,545 | 1,248,000 | 6,655,814 | 7,321,395 |
| 2021 | 1,134,545 | 1,248,000 | 7,790,359 | 8,569,395 |
| 2022 | 1,134,545 | 1,248,000 | 8,924,905 | 9,817,395 |
| 2023 | 1,134,545 | 1,248,000 | 10,059,450 | 11,065,395 |
| 2024 | 1,134,545 | 1,248,000 | 11,193,996 | 12,313,395 |
| 2025 | 1,134,545 | 1,248,000 | 12,328,541 | 13,561,395 |
| 2026 | 1,134,545 | 1,248,000 | 13,463,087 | 14,809,395 |
| 2027 | 1,134,545 | 1,248,000 | 14,597,632 | 16,057,395 |
| 2028 | 1,134,545 | 1,248,000 | 15,732,178 | 17,305,395 |
| 2029 | 1,134,545 | 1,248,000 | 16,866,723 | 18,553,395 |
| 2030 | 1,134,545 | 1,248,000 | 18,001,268 | 19,801,395 |
| 2031 | 1,134,545 | 1,248,000 | 19,135,814 | 21,049,395 |
| 2032 | 1,134,545 | 1,248,000 | 20,270,359 | 22,297,395 |
| 2033 | 1,134,545 | 1,248,000 | 21,404,905 | 23,545,395 |
| 2034 | 1,134,545 | 1,248,000 | 22,539,450 | 24,793,395 |
| 2035 | 1,134,545 | 1,248,000 | 23,673,996 | 26,041,395 |
| 2036 | 1,134,545 | 1,248,000 | 24,808,541 | 27,289,395 |
| 2037 | 1,134,545 | 1,248,000 | 25,943,087 | 28,537,395 |
| 2038 | 1,134,545 | 1,248,000 | 27,077,632 | 29,785,395 |
| 2039 | 1,134,545 | 1,248,000 | 28,212,178 | 31,033,395 |
| 2040 | 1,134,545 | 1,248,000 | 29,346,723 | 32,281,395 |
| 2041 | 1,134,545 | 1,248,000 | 30,481,268 | 33,529,395 |
| 2042 | 1,134,545 | 1,248,000 | 31,615,814 | 34,777,395 |
| 2043 | 1,134,545 | 1,248,000 | 32,750,359 | 36,025,395 |
| 2044 | 1,134,545 | 1,248,000 | 33,884,905 | 37,273,395 |

WASTE ACCEPTANCE RATES (Continued)

| Year | Waste Accepted | | Waste-In-Place | |
|---|---|---|---|---|
| | *(Mg/year)* | *(short tons/year)* | *(Mg)* | *(short tons)* |
| 2045 | 1,134,545 | 1,248,000 | 35,019,450 | 38,521,395 |
| 2046 | 1,134,545 | 1,248,000 | 36,153,996 | 39,769,395 |
| 2047 | 1,134,545 | 1,248,000 | 37,288,541 | 41,017,395 |
| 2048 | 1,134,545 | 1,248,000 | 38,423,087 | 42,265,395 |
| 2049 | 1,134,545 | 1,248,000 | 39,557,632 | 43,513,395 |
| 2050 | 1,134,545 | 1,248,000 | 40,692,178 | 44,761,395 |
| 2051 | 1,134,545 | 1,248,000 | 41,826,723 | 46,009,395 |
| 2052 | 620,537 | 682,591 | 42,961,268 | 47,257,395 |
| 2053 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2054 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2055 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2056 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2057 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2058 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2059 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2060 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2061 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2062 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2063 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2064 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2065 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2066 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2067 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2068 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2069 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2070 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2071 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2072 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2073 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2074 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2075 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2076 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2077 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2078 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2079 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2080 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2081 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2082 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2083 | 0 | 0 | 43,581,805 | 47,939,986 |
| 2084 | 0 | 0 | 43,581,805 | 47,939,986 |

## Pollutant Parameters

| | | Gas / Pollutant Default Parameters: | | User-specified Pollutant Parameters: | |
|---|---|---|---|---|---|
| | Compound | Concentration (*ppmv*) | Molecular Weight | Concentration (*ppmv*) | Molecular Weight |
| Gases | Total landfill gas | | 0.00 | | |
| | Methane | | 16.04 | | |
| | Carbon dioxide | | 44.01 | | |
| | NMOC | 4,000 | 86.18 | | |
| Pollutants | 1,1,1-Trichloroethane (methyl chloroform) - HAP | 0.48 | 133.41 | | |
| | 1,1,2,2-Tetrachloroethane - HAP/VOC | 1.1 | 167.85 | | |
| | 1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC | 2.4 | 98.97 | | |
| | 1,1-Dichloroethene (vinylidene chloride) - HAP/VOC | 0.20 | 96.94 | | |
| | 1,2-Dichloroethane (ethylene dichloride) - HAP/VOC | 0.41 | 98.96 | | |
| | 1,2-Dichloropropane (propylene dichloride) - HAP/VOC | 0.18 | 112.99 | | |
| | 2-Propanol (isopropyl alcohol) - VOC | 50 | 60.11 | | |
| | Acetone | 7.0 | 58.08 | | |
| | Acrylonitrile - HAP/VOC | 6.3 | 53.06 | | |
| | Benzene - No or Unknown Co-disposal - HAP/VOC | 1.9 | 78.11 | | |
| | Benzene - Co-disposal - HAP/VOC | 11 | 78.11 | | |
| | Bromodichloromethane - VOC | 3.1 | 163.83 | | |
| | Butane - VOC | 5.0 | 58.12 | | |
| | Carbon disulfide - HAP/VOC | 0.58 | 76.13 | | |
| | Carbon monoxide | 140 | 28.01 | | |
| | Carbon tetrachloride - HAP/VOC | 4.0E-03 | 153.84 | | |
| | Carbonyl sulfide - HAP/VOC | 0.49 | 60.07 | | |
| | Chlorobenzene - HAP/VOC | 0.25 | 112.56 | | |
| | Chlorodifluoromethane | 1.3 | 86.47 | | |
| | Chloroethane (ethyl chloride) - HAP/VOC | 1.3 | 64.52 | | |
| | Chloroform - HAP/VOC | 0.03 | 119.39 | | |
| | Chloromethane - VOC | 1.2 | 50.49 | | |
| | Dichlorobenzene - (HAP for para isomer/VOC) | 0.21 | 147 | | |
| | Dichlorodifluoromethane | 16 | 120.91 | | |
| | Dichlorofluoromethane - VOC | 2.6 | 102.92 | | |
| | Dichloromethane (methylene chloride) - HAP | 14 | 84.94 | | |
| | Dimethyl sulfide (methyl sulfide) - VOC | 7.8 | 62.13 | | |
| | Ethane | 890 | 30.07 | | |
| | Ethanol - VOC | 27 | 46.08 | | |

## Pollutant Parameters (Continued)

| | Compound | Gas / Pollutant Default Parameters: Concentration (*ppmv*) | Molecular Weight | User-specified Pollutant Parameters: Concentration (*ppmv*) | Molecular Weight |
|---|---|---|---|---|---|
| Pollutants | Ethyl mercaptan (ethanethiol) - VOC | 2.3 | 62.13 | | |
| | Ethylbenzene - HAP/VOC | 4.6 | 106.16 | | |
| | Ethylene dibromide - HAP/VOC | 1.0E-03 | 187.88 | | |
| | Fluorotrichloromethane - VOC | 0.76 | 137.38 | | |
| | Hexane - HAP/VOC | 6.6 | 86.18 | | |
| | Hydrogen sulfide | 36 | 34.08 | | |
| | Mercury (total) - HAP | 2.9E-04 | 200.61 | | |
| | Methyl ethyl ketone - HAP/VOC | 7.1 | 72.11 | | |
| | Methyl isobutyl ketone - HAP/VOC | 1.9 | 100.16 | | |
| | Methyl mercaptan - VOC | 2.5 | 48.11 | | |
| | Pentane - VOC | 3.3 | 72.15 | | |
| | Perchloroethylene (tetrachloroethylene) - HAP | 3.7 | 165.83 | | |
| | Propane - VOC | 11 | 44.09 | | |
| | t-1,2-Dichloroethene - VOC | 2.8 | 96.94 | | |
| | Toluene - No or Unknown Co-disposal - HAP/VOC | 39 | 92.13 | | |
| | Toluene - Co-disposal - HAP/VOC | 170 | 92.13 | | |
| | Trichloroethylene (trichloroethene) - HAP/VOC | 2.8 | 131.40 | | |
| | Vinyl chloride - HAP/VOC | 7.3 | 62.50 | | |
| | Xylenes - HAP/VOC | 12 | 106.16 | | |
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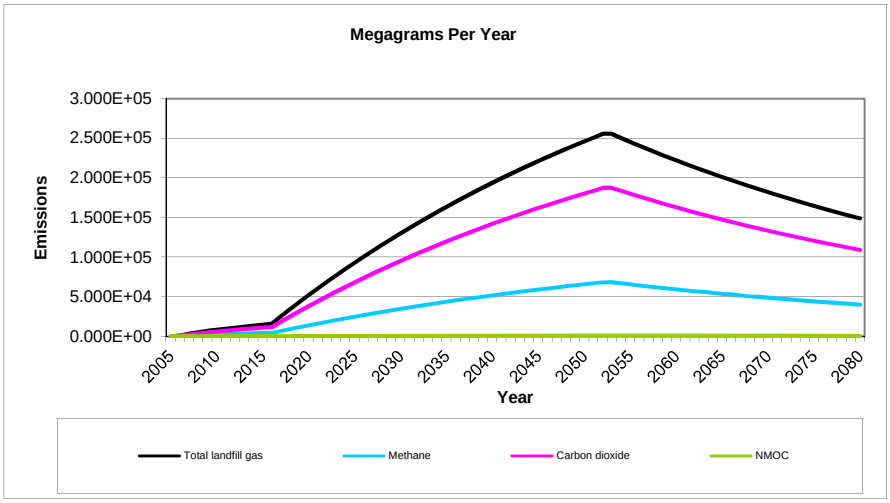
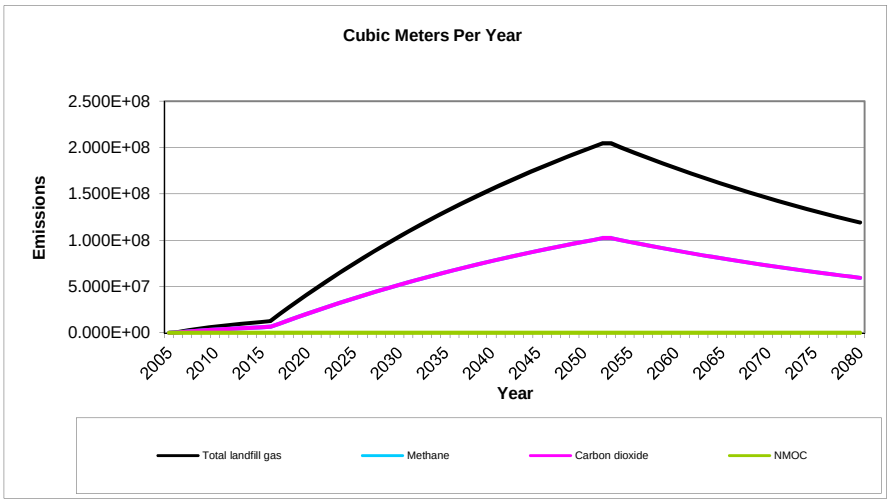
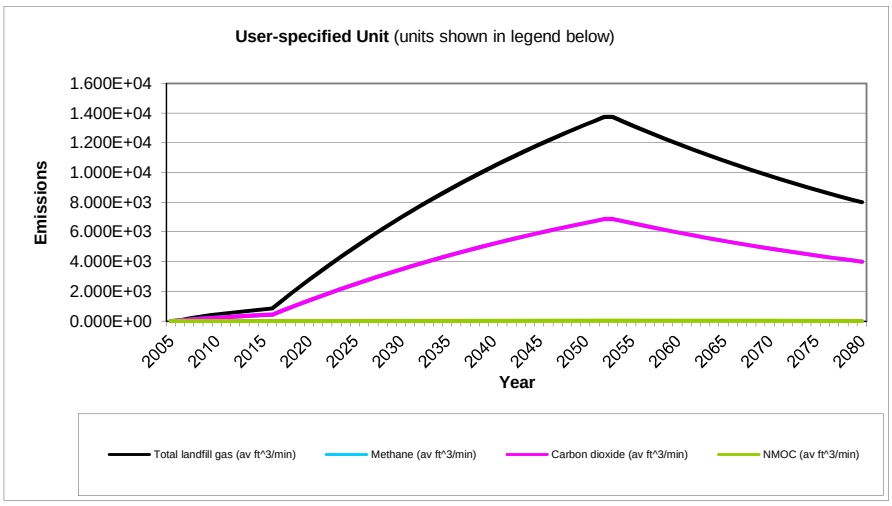
## Graphs


Megagrams Per Year
Emissions
3.000E+05
2.500E+05
2.000E+05
1.500E+05
1.000E+05
5.000E+04
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
2.500E+08
2.000E+08
1.500E+08
1.000E+08
5.000E+07
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
1.600E+04
1.400E+04
1.200E+04
1.000E+04
8.000E+03
6.000E+03
4.000E+03
2.000E+03
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

## Results

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 1.180E+03 | 9.451E+05 | 6.350E+01 | 3.153E+02 | 4.726E+05 | 3.175E+01 |
| 2007 | 3.414E+03 | 2.733E+06 | 1.837E+02 | 9.118E+02 | 1.367E+06 | 9.183E+01 |
| 2008 | 5.572E+03 | 4.462E+06 | 2.998E+02 | 1.488E+03 | 2.231E+06 | 1.499E+02 |
| 2009 | 7.086E+03 | 5.674E+06 | 3.812E+02 | 1.893E+03 | 2.837E+06 | 1.906E+02 |
| 2010 | 8.507E+03 | 6.812E+06 | 4.577E+02 | 2.272E+03 | 3.406E+06 | 2.288E+02 |
| 2011 | 9.771E+03 | 7.824E+06 | 5.257E+02 | 2.610E+03 | 3.912E+06 | 2.628E+02 |
| 2012 | 1.112E+04 | 8.905E+06 | 5.983E+02 | 2.970E+03 | 4.453E+06 | 2.992E+02 |
| 2013 | 1.236E+04 | 9.894E+06 | 6.648E+02 | 3.300E+03 | 4.947E+06 | 3.324E+02 |
| 2014 | 1.353E+04 | 1.084E+07 | 7.282E+02 | 3.615E+03 | 5.419E+06 | 3.641E+02 |
| 2015 | 1.492E+04 | 1.194E+07 | 8.026E+02 | 3.984E+03 | 5.972E+06 | 4.013E+02 |
| 2016 | 1.609E+04 | 1.288E+07 | 8.657E+02 | 4.298E+03 | 6.442E+06 | 4.329E+02 |
| 2017 | 2.532E+04 | 2.028E+07 | 1.362E+03 | 6.763E+03 | 1.014E+07 | 6.811E+02 |
| 2018 | 3.437E+04 | 2.752E+07 | 1.849E+03 | 9.180E+03 | 1.376E+07 | 9.245E+02 |
| 2019 | 4.324E+04 | 3.462E+07 | 2.326E+03 | 1.155E+04 | 1.731E+07 | 1.163E+03 |
| 2020 | 5.193E+04 | 4.158E+07 | 2.794E+03 | 1.387E+04 | 2.079E+07 | 1.397E+03 |
| 2021 | 6.045E+04 | 4.840E+07 | 3.252E+03 | 1.615E+04 | 2.420E+07 | 1.626E+03 |
| 2022 | 6.880E+04 | 5.509E+07 | 3.702E+03 | 1.838E+04 | 2.755E+07 | 1.851E+03 |
| 2023 | 7.699E+04 | 6.165E+07 | 4.142E+03 | 2.056E+04 | 3.082E+07 | 2.071E+03 |
| 2024 | 8.501E+04 | 6.807E+07 | 4.574E+03 | 2.271E+04 | 3.404E+07 | 2.287E+03 |
| 2025 | 9.287E+04 | 7.437E+07 | 4.997E+03 | 2.481E+04 | 3.718E+07 | 2.498E+03 |
| 2026 | 1.006E+05 | 8.054E+07 | 5.412E+03 | 2.687E+04 | 4.027E+07 | 2.706E+03 |
| 2027 | 1.081E+05 | 8.659E+07 | 5.818E+03 | 2.889E+04 | 4.330E+07 | 2.909E+03 |
| 2028 | 1.155E+05 | 9.252E+07 | 6.217E+03 | 3.086E+04 | 4.626E+07 | 3.108E+03 |
| 2029 | 1.228E+05 | 9.834E+07 | 6.607E+03 | 3.280E+04 | 4.917E+07 | 3.304E+03 |
| 2030 | 1.299E+05 | 1.040E+08 | 6.990E+03 | 3.470E+04 | 5.202E+07 | 3.495E+03 |
| 2031 | 1.369E+05 | 1.096E+08 | 7.366E+03 | 3.657E+04 | 5.481E+07 | 3.683E+03 |
| 2032 | 1.437E+05 | 1.151E+08 | 7.733E+03 | 3.839E+04 | 5.755E+07 | 3.867E+03 |
| 2033 | 1.504E+05 | 1.205E+08 | 8.094E+03 | 4.018E+04 | 6.023E+07 | 4.047E+03 |
| 2034 | 1.570E+05 | 1.257E+08 | 8.448E+03 | 4.194E+04 | 6.286E+07 | 4.224E+03 |
| 2035 | 1.634E+05 | 1.309E+08 | 8.794E+03 | 4.366E+04 | 6.544E+07 | 4.397E+03 |
| 2036 | 1.698E+05 | 1.359E+08 | 9.134E+03 | 4.534E+04 | 6.797E+07 | 4.567E+03 |
| 2037 | 1.759E+05 | 1.409E+08 | 9.466E+03 | 4.700E+04 | 7.045E+07 | 4.733E+03 |
| 2038 | 1.820E+05 | 1.457E+08 | 9.793E+03 | 4.862E+04 | 7.287E+07 | 4.896E+03 |
| 2039 | 1.880E+05 | 1.505E+08 | 1.011E+04 | 5.021E+04 | 7.525E+07 | 5.056E+03 |
| 2040 | 1.938E+05 | 1.552E+08 | 1.043E+04 | 5.176E+04 | 7.759E+07 | 5.213E+03 |
| 2041 | 1.995E+05 | 1.597E+08 | 1.073E+04 | 5.329E+04 | 7.987E+07 | 5.367E+03 |
| 2042 | 2.051E+05 | 1.642E+08 | 1.103E+04 | 5.478E+04 | 8.211E+07 | 5.517E+03 |
| 2043 | 2.106E+05 | 1.686E+08 | 1.133E+04 | 5.625E+04 | 8.431E+07 | 5.665E+03 |
| 2044 | 2.160E+05 | 1.729E+08 | 1.162E+04 | 5.768E+04 | 8.646E+07 | 5.810E+03 |
| 2045 | 2.212E+05 | 1.772E+08 | 1.190E+04 | 5.909E+04 | 8.858E+07 | 5.951E+03 |
| 2046 | 2.264E+05 | 1.813E+08 | 1.218E+04 | 6.047E+04 | 9.064E+07 | 6.090E+03 |
| 2047 | 2.315E+05 | 1.853E+08 | 1.245E+04 | 6.183E+04 | 9.267E+07 | 6.227E+03 |
| 2048 | 2.364E+05 | 1.893E+08 | 1.272E+04 | 6.315E+04 | 9.466E+07 | 6.360E+03 |
| 2049 | 2.413E+05 | 1.932E+08 | 1.298E+04 | 6.445E+04 | 9.661E+07 | 6.491E+03 |
| 2050 | 2.461E+05 | 1.970E+08 | 1.324E+04 | 6.573E+04 | 9.852E+07 | 6.619E+03 |
| 2051 | 2.507E+05 | 2.008E+08 | 1.349E+04 | 6.698E+04 | 1.004E+08 | 6.745E+03 |
| 2052 | 2.553E+05 | 2.045E+08 | 1.374E+04 | 6.820E+04 | 1.022E+08 | 6.869E+03 |
| 2053 | 2.555E+05 | 2.046E+08 | 1.375E+04 | 6.824E+04 | 1.023E+08 | 6.873E+03 |
| 2054 | 2.504E+05 | 2.005E+08 | 1.347E+04 | 6.689E+04 | 1.003E+08 | 6.737E+03 |

## Results (Continued)

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2055 | 2.455E+05 | 1.966E+08 | 1.321E+04 | 6.557E+04 | 9.828E+07 | 6.604E+03 |
| 2056 | 2.406E+05 | 1.927E+08 | 1.295E+04 | 6.427E+04 | 9.634E+07 | 6.473E+03 |
| 2057 | 2.358E+05 | 1.889E+08 | 1.269E+04 | 6.300E+04 | 9.443E+07 | 6.345E+03 |
| 2058 | 2.312E+05 | 1.851E+08 | 1.244E+04 | 6.175E+04 | 9.256E+07 | 6.219E+03 |
| 2059 | 2.266E+05 | 1.815E+08 | 1.219E+04 | 6.053E+04 | 9.073E+07 | 6.096E+03 |
| 2060 | 2.221E+05 | 1.779E+08 | 1.195E+04 | 5.933E+04 | 8.893E+07 | 5.975E+03 |
| 2061 | 2.177E+05 | 1.743E+08 | 1.171E+04 | 5.815E+04 | 8.717E+07 | 5.857E+03 |
| 2062 | 2.134E+05 | 1.709E+08 | 1.148E+04 | 5.700E+04 | 8.544E+07 | 5.741E+03 |
| 2063 | 2.092E+05 | 1.675E+08 | 1.125E+04 | 5.587E+04 | 8.375E+07 | 5.627E+03 |
| 2064 | 2.050E+05 | 1.642E+08 | 1.103E+04 | 5.477E+04 | 8.209E+07 | 5.516E+03 |
| 2065 | 2.010E+05 | 1.609E+08 | 1.081E+04 | 5.368E+04 | 8.047E+07 | 5.407E+03 |
| 2066 | 1.970E+05 | 1.577E+08 | 1.060E+04 | 5.262E+04 | 7.887E+07 | 5.299E+03 |
| 2067 | 1.931E+05 | 1.546E+08 | 1.039E+04 | 5.158E+04 | 7.731E+07 | 5.195E+03 |
| 2068 | 1.893E+05 | 1.516E+08 | 1.018E+04 | 5.056E+04 | 7.578E+07 | 5.092E+03 |
| 2069 | 1.855E+05 | 1.486E+08 | 9.982E+03 | 4.956E+04 | 7.428E+07 | 4.991E+03 |
| 2070 | 1.819E+05 | 1.456E+08 | 9.784E+03 | 4.857E+04 | 7.281E+07 | 4.892E+03 |
| 2071 | 1.783E+05 | 1.427E+08 | 9.590E+03 | 4.761E+04 | 7.137E+07 | 4.795E+03 |
| 2072 | 1.747E+05 | 1.399E+08 | 9.400E+03 | 4.667E+04 | 6.995E+07 | 4.700E+03 |
| 2073 | 1.713E+05 | 1.371E+08 | 9.214E+03 | 4.575E+04 | 6.857E+07 | 4.607E+03 |
| 2074 | 1.679E+05 | 1.344E+08 | 9.032E+03 | 4.484E+04 | 6.721E+07 | 4.516E+03 |
| 2075 | 1.645E+05 | 1.318E+08 | 8.853E+03 | 4.395E+04 | 6.588E+07 | 4.426E+03 |
| 2076 | 1.613E+05 | 1.292E+08 | 8.678E+03 | 4.308E+04 | 6.458E+07 | 4.339E+03 |
| 2077 | 1.581E+05 | 1.266E+08 | 8.506E+03 | 4.223E+04 | 6.330E+07 | 4.253E+03 |
| 2078 | 1.550E+05 | 1.241E+08 | 8.337E+03 | 4.139E+04 | 6.204E+07 | 4.169E+03 |
| 2079 | 1.519E+05 | 1.216E+08 | 8.172E+03 | 4.057E+04 | 6.082E+07 | 4.086E+03 |
| 2080 | 1.489E+05 | 1.192E+08 | 8.011E+03 | 3.977E+04 | 5.961E+07 | 4.005E+03 |
| 2081 | 1.459E+05 | 1.169E+08 | 7.852E+03 | 3.898E+04 | 5.843E+07 | 3.926E+03 |
| 2082 | 1.430E+05 | 1.145E+08 | 7.696E+03 | 3.821E+04 | 5.727E+07 | 3.848E+03 |
| 2083 | 1.402E+05 | 1.123E+08 | 7.544E+03 | 3.745E+04 | 5.614E+07 | 3.772E+03 |
| 2084 | 1.374E+05 | 1.101E+08 | 7.395E+03 | 3.671E+04 | 5.503E+07 | 3.697E+03 |
| 2085 | 1.347E+05 | 1.079E+08 | 7.248E+03 | 3.598E+04 | 5.394E+07 | 3.624E+03 |
| 2086 | 1.321E+05 | 1.057E+08 | 7.105E+03 | 3.527E+04 | 5.287E+07 | 3.552E+03 |
| 2087 | 1.294E+05 | 1.036E+08 | 6.964E+03 | 3.457E+04 | 5.182E+07 | 3.482E+03 |
| 2088 | 1.269E+05 | 1.016E+08 | 6.826E+03 | 3.389E+04 | 5.080E+07 | 3.413E+03 |
| 2089 | 1.244E+05 | 9.958E+07 | 6.691E+03 | 3.322E+04 | 4.979E+07 | 3.345E+03 |
| 2090 | 1.219E+05 | 9.761E+07 | 6.558E+03 | 3.256E+04 | 4.881E+07 | 3.279E+03 |
| 2091 | 1.195E+05 | 9.568E+07 | 6.429E+03 | 3.192E+04 | 4.784E+07 | 3.214E+03 |
| 2092 | 1.171E+05 | 9.378E+07 | 6.301E+03 | 3.128E+04 | 4.689E+07 | 3.151E+03 |
| 2093 | 1.148E+05 | 9.193E+07 | 6.177E+03 | 3.066E+04 | 4.596E+07 | 3.088E+03 |
| 2094 | 1.125E+05 | 9.011E+07 | 6.054E+03 | 3.006E+04 | 4.505E+07 | 3.027E+03 |
| 2095 | 1.103E+05 | 8.832E+07 | 5.934E+03 | 2.946E+04 | 4.416E+07 | 2.967E+03 |
| 2096 | 1.081E+05 | 8.657E+07 | 5.817E+03 | 2.888E+04 | 4.329E+07 | 2.908E+03 |
| 2097 | 1.060E+05 | 8.486E+07 | 5.702E+03 | 2.831E+04 | 4.243E+07 | 2.851E+03 |
| 2098 | 1.039E+05 | 8.318E+07 | 5.589E+03 | 2.775E+04 | 4.159E+07 | 2.794E+03 |
| 2099 | 1.018E+05 | 8.153E+07 | 5.478E+03 | 2.720E+04 | 4.077E+07 | 2.739E+03 |
| 2100 | 9.980E+04 | 7.992E+07 | 5.370E+03 | 2.666E+04 | 3.996E+07 | 2.685E+03 |
| 2101 | 9.783E+04 | 7.833E+07 | 5.263E+03 | 2.613E+04 | 3.917E+07 | 2.632E+03 |
| 2102 | 9.589E+04 | 7.678E+07 | 5.159E+03 | 2.561E+04 | 3.839E+07 | 2.580E+03 |
| 2103 | 9.399E+04 | 7.526E+07 | 5.057E+03 | 2.511E+04 | 3.763E+07 | 2.528E+03 |
| 2104 | 9.213E+04 | 7.377E+07 | 4.957E+03 | 2.461E+04 | 3.689E+07 | 2.478E+03 |
| 2105 | 9.030E+04 | 7.231E+07 | 4.859E+03 | 2.412E+04 | 3.616E+07 | 2.429E+03 |

## Results (Continued)

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2106 | 8.852E+04 | 7.088E+07 | 4.762E+03 | 2.364E+04 | 3.544E+07 | 2.381E+03 |
| 2107 | 8.676E+04 | 6.948E+07 | 4.668E+03 | 2.318E+04 | 3.474E+07 | 2.334E+03 |
| 2108 | 8.505E+04 | 6.810E+07 | 4.576E+03 | 2.272E+04 | 3.405E+07 | 2.288E+03 |
| 2109 | 8.336E+04 | 6.675E+07 | 4.485E+03 | 2.227E+04 | 3.338E+07 | 2.243E+03 |
| 2110 | 8.171E+04 | 6.543E+07 | 4.396E+03 | 2.183E+04 | 3.272E+07 | 2.198E+03 |
| 2111 | 8.009E+04 | 6.413E+07 | 4.309E+03 | 2.139E+04 | 3.207E+07 | 2.155E+03 |
| 2112 | 7.851E+04 | 6.286E+07 | 4.224E+03 | 2.097E+04 | 3.143E+07 | 2.112E+03 |
| 2113 | 7.695E+04 | 6.162E+07 | 4.140E+03 | 2.055E+04 | 3.081E+07 | 2.070E+03 |
| 2114 | 7.543E+04 | 6.040E+07 | 4.058E+03 | 2.015E+04 | 3.020E+07 | 2.029E+03 |
| 2115 | 7.394E+04 | 5.920E+07 | 3.978E+03 | 1.975E+04 | 2.960E+07 | 1.989E+03 |
| 2116 | 7.247E+04 | 5.803E+07 | 3.899E+03 | 1.936E+04 | 2.902E+07 | 1.950E+03 |
| 2117 | 7.104E+04 | 5.688E+07 | 3.822E+03 | 1.897E+04 | 2.844E+07 | 1.911E+03 |
| 2118 | 6.963E+04 | 5.576E+07 | 3.746E+03 | 1.860E+04 | 2.788E+07 | 1.873E+03 |
| 2119 | 6.825E+04 | 5.465E+07 | 3.672E+03 | 1.823E+04 | 2.733E+07 | 1.836E+03 |
| 2120 | 6.690E+04 | 5.357E+07 | 3.599E+03 | 1.787E+04 | 2.678E+07 | 1.800E+03 |
| 2121 | 6.557E+04 | 5.251E+07 | 3.528E+03 | 1.752E+04 | 2.625E+07 | 1.764E+03 |
| 2122 | 6.428E+04 | 5.147E+07 | 3.458E+03 | 1.717E+04 | 2.573E+07 | 1.729E+03 |
| 2123 | 6.300E+04 | 5.045E+07 | 3.390E+03 | 1.683E+04 | 2.523E+07 | 1.695E+03 |
| 2124 | 6.176E+04 | 4.945E+07 | 3.323E+03 | 1.650E+04 | 2.473E+07 | 1.661E+03 |
| 2125 | 6.053E+04 | 4.847E+07 | 3.257E+03 | 1.617E+04 | 2.424E+07 | 1.628E+03 |
| 2126 | 5.933E+04 | 4.751E+07 | 3.192E+03 | 1.585E+04 | 2.376E+07 | 1.596E+03 |
| 2127 | 5.816E+04 | 4.657E+07 | 3.129E+03 | 1.554E+04 | 2.329E+07 | 1.565E+03 |
| 2128 | 5.701E+04 | 4.565E+07 | 3.067E+03 | 1.523E+04 | 2.282E+07 | 1.534E+03 |
| 2129 | 5.588E+04 | 4.475E+07 | 3.006E+03 | 1.493E+04 | 2.237E+07 | 1.503E+03 |
| 2130 | 5.477E+04 | 4.386E+07 | 2.947E+03 | 1.463E+04 | 2.193E+07 | 1.473E+03 |
| 2131 | 5.369E+04 | 4.299E+07 | 2.889E+03 | 1.434E+04 | 2.150E+07 | 1.444E+03 |
| 2132 | 5.262E+04 | 4.214E+07 | 2.831E+03 | 1.406E+04 | 2.107E+07 | 1.416E+03 |
| 2133 | 5.158E+04 | 4.131E+07 | 2.775E+03 | 1.378E+04 | 2.065E+07 | 1.388E+03 |
| 2134 | 5.056E+04 | 4.049E+07 | 2.720E+03 | 1.351E+04 | 2.024E+07 | 1.360E+03 |
| 2135 | 4.956E+04 | 3.969E+07 | 2.666E+03 | 1.324E+04 | 1.984E+07 | 1.333E+03 |
| 2136 | 4.858E+04 | 3.890E+07 | 2.614E+03 | 1.298E+04 | 1.945E+07 | 1.307E+03 |
| 2137 | 4.762E+04 | 3.813E+07 | 2.562E+03 | 1.272E+04 | 1.906E+07 | 1.281E+03 |
| 2138 | 4.667E+04 | 3.737E+07 | 2.511E+03 | 1.247E+04 | 1.869E+07 | 1.256E+03 |
| 2139 | 4.575E+04 | 3.663E+07 | 2.461E+03 | 1.222E+04 | 1.832E+07 | 1.231E+03 |
| 2140 | 4.484E+04 | 3.591E+07 | 2.413E+03 | 1.198E+04 | 1.795E+07 | 1.206E+03 |
| 2141 | 4.396E+04 | 3.520E+07 | 2.365E+03 | 1.174E+04 | 1.760E+07 | 1.182E+03 |
| 2142 | 4.309E+04 | 3.450E+07 | 2.318E+03 | 1.151E+04 | 1.725E+07 | 1.159E+03 |
| 2143 | 4.223E+04 | 3.382E+07 | 2.272E+03 | 1.128E+04 | 1.691E+07 | 1.136E+03 |
| 2144 | 4.140E+04 | 3.315E+07 | 2.227E+03 | 1.106E+04 | 1.657E+07 | 1.114E+03 |
| 2145 | 4.058E+04 | 3.249E+07 | 2.183E+03 | 1.084E+04 | 1.625E+07 | 1.092E+03 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 8.650E+02 | 4.726E+05 | 3.175E+01 | 3.269E+00 | 9.120E+02 | 6.128E-02 |
| 2007 | 2.502E+03 | 1.367E+06 | 9.183E+01 | 9.455E+00 | 2.638E+03 | 1.772E-01 |
| 2008 | 4.084E+03 | 2.231E+06 | 1.499E+02 | 1.543E+01 | 4.306E+03 | 2.893E-01 |
| 2009 | 5.193E+03 | 2.837E+06 | 1.906E+02 | 1.963E+01 | 5.475E+03 | 3.679E-01 |
| 2010 | 6.235E+03 | 3.406E+06 | 2.288E+02 | 2.356E+01 | 6.574E+03 | 4.417E-01 |
| 2011 | 7.161E+03 | 3.912E+06 | 2.628E+02 | 2.706E+01 | 7.550E+03 | 5.073E-01 |
| 2012 | 8.150E+03 | 4.453E+06 | 2.992E+02 | 3.080E+01 | 8.593E+03 | 5.774E-01 |
| 2013 | 9.055E+03 | 4.947E+06 | 3.324E+02 | 3.422E+01 | 9.547E+03 | 6.415E-01 |
| 2014 | 9.919E+03 | 5.419E+06 | 3.641E+02 | 3.749E+01 | 1.046E+04 | 7.027E-01 |
| 2015 | 1.093E+04 | 5.972E+06 | 4.013E+02 | 4.132E+01 | 1.153E+04 | 7.745E-01 |
| 2016 | 1.179E+04 | 6.442E+06 | 4.329E+02 | 4.457E+01 | 1.243E+04 | 8.354E-01 |
| 2017 | 1.856E+04 | 1.014E+07 | 6.811E+02 | 7.013E+01 | 1.957E+04 | 1.315E+00 |
| 2018 | 2.519E+04 | 1.376E+07 | 9.245E+02 | 9.519E+01 | 2.656E+04 | 1.784E+00 |
| 2019 | 3.169E+04 | 1.731E+07 | 1.163E+03 | 1.198E+02 | 3.341E+04 | 2.245E+00 |
| 2020 | 3.806E+04 | 2.079E+07 | 1.397E+03 | 1.438E+02 | 4.013E+04 | 2.696E+00 |
| 2021 | 4.430E+04 | 2.420E+07 | 1.626E+03 | 1.674E+02 | 4.671E+04 | 3.138E+00 |
| 2022 | 5.042E+04 | 2.755E+07 | 1.851E+03 | 1.906E+02 | 5.316E+04 | 3.572E+00 |
| 2023 | 5.642E+04 | 3.082E+07 | 2.071E+03 | 2.132E+02 | 5.949E+04 | 3.997E+00 |
| 2024 | 6.230E+04 | 3.404E+07 | 2.287E+03 | 2.355E+02 | 6.569E+04 | 4.414E+00 |
| 2025 | 6.807E+04 | 3.718E+07 | 2.498E+03 | 2.572E+02 | 7.177E+04 | 4.822E+00 |
| 2026 | 7.372E+04 | 4.027E+07 | 2.706E+03 | 2.786E+02 | 7.772E+04 | 5.222E+00 |
| 2027 | 7.925E+04 | 4.330E+07 | 2.909E+03 | 2.995E+02 | 8.356E+04 | 5.615E+00 |
| 2028 | 8.468E+04 | 4.626E+07 | 3.108E+03 | 3.200E+02 | 8.929E+04 | 5.999E+00 |
| 2029 | 9.000E+04 | 4.917E+07 | 3.304E+03 | 3.402E+02 | 9.490E+04 | 6.376E+00 |
| 2030 | 9.522E+04 | 5.202E+07 | 3.495E+03 | 3.599E+02 | 1.004E+05 | 6.746E+00 |
| 2031 | 1.003E+05 | 5.481E+07 | 3.683E+03 | 3.792E+02 | 1.058E+05 | 7.108E+00 |
| 2032 | 1.053E+05 | 5.755E+07 | 3.867E+03 | 3.981E+02 | 1.111E+05 | 7.463E+00 |
| 2033 | 1.103E+05 | 6.023E+07 | 4.047E+03 | 4.167E+02 | 1.162E+05 | 7.811E+00 |
| 2034 | 1.151E+05 | 6.286E+07 | 4.224E+03 | 4.349E+02 | 1.213E+05 | 8.152E+00 |
| 2035 | 1.198E+05 | 6.544E+07 | 4.397E+03 | 4.527E+02 | 1.263E+05 | 8.486E+00 |
| 2036 | 1.244E+05 | 6.797E+07 | 4.567E+03 | 4.702E+02 | 1.312E+05 | 8.814E+00 |
| 2037 | 1.290E+05 | 7.045E+07 | 4.733E+03 | 4.873E+02 | 1.360E+05 | 9.135E+00 |
| 2038 | 1.334E+05 | 7.287E+07 | 4.896E+03 | 5.041E+02 | 1.406E+05 | 9.450E+00 |
| 2039 | 1.378E+05 | 7.525E+07 | 5.056E+03 | 5.206E+02 | 1.452E+05 | 9.759E+00 |
| 2040 | 1.420E+05 | 7.759E+07 | 5.213E+03 | 5.367E+02 | 1.497E+05 | 1.006E+01 |
| 2041 | 1.462E+05 | 7.987E+07 | 5.367E+03 | 5.526E+02 | 1.542E+05 | 1.036E+01 |
| 2042 | 1.503E+05 | 8.211E+07 | 5.517E+03 | 5.681E+02 | 1.585E+05 | 1.065E+01 |
| 2043 | 1.543E+05 | 8.431E+07 | 5.665E+03 | 5.833E+02 | 1.627E+05 | 1.093E+01 |
| 2044 | 1.583E+05 | 8.646E+07 | 5.810E+03 | 5.982E+02 | 1.669E+05 | 1.121E+01 |
| 2045 | 1.621E+05 | 8.858E+07 | 5.951E+03 | 6.128E+02 | 1.710E+05 | 1.149E+01 |
| 2046 | 1.659E+05 | 9.064E+07 | 6.090E+03 | 6.271E+02 | 1.749E+05 | 1.175E+01 |
| 2047 | 1.696E+05 | 9.267E+07 | 6.227E+03 | 6.411E+02 | 1.789E+05 | 1.202E+01 |
| 2048 | 1.733E+05 | 9.466E+07 | 6.360E+03 | 6.549E+02 | 1.827E+05 | 1.228E+01 |
| 2049 | 1.768E+05 | 9.661E+07 | 6.491E+03 | 6.683E+02 | 1.865E+05 | 1.253E+01 |
| 2050 | 1.803E+05 | 9.852E+07 | 6.619E+03 | 6.816E+02 | 1.901E+05 | 1.278E+01 |
| 2051 | 1.838E+05 | 1.004E+08 | 6.745E+03 | 6.945E+02 | 1.938E+05 | 1.302E+01 |
| 2052 | 1.871E+05 | 1.022E+08 | 6.869E+03 | 7.072E+02 | 1.973E+05 | 1.326E+01 |
| 2053 | 1.872E+05 | 1.023E+08 | 6.873E+03 | 7.077E+02 | 1.974E+05 | 1.326E+01 |
| 2054 | 1.835E+05 | 1.003E+08 | 6.737E+03 | 6.937E+02 | 1.935E+05 | 1.300E+01 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2055 | 1.799E+05 | 9.828E+07 | 6.604E+03 | 6.799E+02 | 1.897E+05 | 1.274E+01 |
| 2056 | 1.763E+05 | 9.634E+07 | 6.473E+03 | 6.665E+02 | 1.859E+05 | 1.249E+01 |
| 2057 | 1.729E+05 | 9.443E+07 | 6.345E+03 | 6.533E+02 | 1.822E+05 | 1.225E+01 |
| 2058 | 1.694E+05 | 9.256E+07 | 6.219E+03 | 6.403E+02 | 1.786E+05 | 1.200E+01 |
| 2059 | 1.661E+05 | 9.073E+07 | 6.096E+03 | 6.276E+02 | 1.751E+05 | 1.176E+01 |
| 2060 | 1.628E+05 | 8.893E+07 | 5.975E+03 | 6.152E+02 | 1.716E+05 | 1.153E+01 |
| 2061 | 1.596E+05 | 8.717E+07 | 5.857E+03 | 6.030E+02 | 1.682E+05 | 1.130E+01 |
| 2062 | 1.564E+05 | 8.544E+07 | 5.741E+03 | 5.911E+02 | 1.649E+05 | 1.108E+01 |
| 2063 | 1.533E+05 | 8.375E+07 | 5.627E+03 | 5.794E+02 | 1.616E+05 | 1.086E+01 |
| 2064 | 1.503E+05 | 8.209E+07 | 5.516E+03 | 5.679E+02 | 1.584E+05 | 1.065E+01 |
| 2065 | 1.473E+05 | 8.047E+07 | 5.407E+03 | 5.567E+02 | 1.553E+05 | 1.043E+01 |
| 2066 | 1.444E+05 | 7.887E+07 | 5.299E+03 | 5.456E+02 | 1.522E+05 | 1.023E+01 |
| 2067 | 1.415E+05 | 7.731E+07 | 5.195E+03 | 5.348E+02 | 1.492E+05 | 1.003E+01 |
| 2068 | 1.387E+05 | 7.578E+07 | 5.092E+03 | 5.243E+02 | 1.463E+05 | 9.827E+00 |
| 2069 | 1.360E+05 | 7.428E+07 | 4.991E+03 | 5.139E+02 | 1.434E+05 | 9.632E+00 |
| 2070 | 1.333E+05 | 7.281E+07 | 4.892E+03 | 5.037E+02 | 1.405E+05 | 9.442E+00 |
| 2071 | 1.306E+05 | 7.137E+07 | 4.795E+03 | 4.937E+02 | 1.377E+05 | 9.255E+00 |
| 2072 | 1.281E+05 | 6.995E+07 | 4.700E+03 | 4.839E+02 | 1.350E+05 | 9.071E+00 |
| 2073 | 1.255E+05 | 6.857E+07 | 4.607E+03 | 4.744E+02 | 1.323E+05 | 8.892E+00 |
| 2074 | 1.230E+05 | 6.721E+07 | 4.516E+03 | 4.650E+02 | 1.297E+05 | 8.716E+00 |
| 2075 | 1.206E+05 | 6.588E+07 | 4.426E+03 | 4.558E+02 | 1.271E+05 | 8.543E+00 |
| 2076 | 1.182E+05 | 6.458E+07 | 4.339E+03 | 4.467E+02 | 1.246E+05 | 8.374E+00 |
| 2077 | 1.159E+05 | 6.330E+07 | 4.253E+03 | 4.379E+02 | 1.222E+05 | 8.208E+00 |
| 2078 | 1.136E+05 | 6.204E+07 | 4.169E+03 | 4.292E+02 | 1.197E+05 | 8.046E+00 |
| 2079 | 1.113E+05 | 6.082E+07 | 4.086E+03 | 4.207E+02 | 1.174E+05 | 7.886E+00 |
| 2080 | 1.091E+05 | 5.961E+07 | 4.005E+03 | 4.124E+02 | 1.150E+05 | 7.730E+00 |
| 2081 | 1.070E+05 | 5.843E+07 | 3.926E+03 | 4.042E+02 | 1.128E+05 | 7.577E+00 |
| 2082 | 1.048E+05 | 5.727E+07 | 3.848E+03 | 3.962E+02 | 1.105E+05 | 7.427E+00 |
| 2083 | 1.028E+05 | 5.614E+07 | 3.772E+03 | 3.884E+02 | 1.083E+05 | 7.280E+00 |
| 2084 | 1.007E+05 | 5.503E+07 | 3.697E+03 | 3.807E+02 | 1.062E+05 | 7.136E+00 |
| 2085 | 9.873E+04 | 5.394E+07 | 3.624E+03 | 3.731E+02 | 1.041E+05 | 6.995E+00 |
| 2086 | 9.678E+04 | 5.287E+07 | 3.552E+03 | 3.658E+02 | 1.020E+05 | 6.856E+00 |
| 2087 | 9.486E+04 | 5.182E+07 | 3.482E+03 | 3.585E+02 | 1.000E+05 | 6.720E+00 |
| 2088 | 9.298E+04 | 5.080E+07 | 3.413E+03 | 3.514E+02 | 9.804E+04 | 6.587E+00 |
| 2089 | 9.114E+04 | 4.979E+07 | 3.345E+03 | 3.445E+02 | 9.610E+04 | 6.457E+00 |
| 2090 | 8.934E+04 | 4.881E+07 | 3.279E+03 | 3.376E+02 | 9.419E+04 | 6.329E+00 |
| 2091 | 8.757E+04 | 4.784E+07 | 3.214E+03 | 3.310E+02 | 9.233E+04 | 6.204E+00 |
| 2092 | 8.584E+04 | 4.689E+07 | 3.151E+03 | 3.244E+02 | 9.050E+04 | 6.081E+00 |
| 2093 | 8.414E+04 | 4.596E+07 | 3.088E+03 | 3.180E+02 | 8.871E+04 | 5.960E+00 |
| 2094 | 8.247E+04 | 4.505E+07 | 3.027E+03 | 3.117E+02 | 8.695E+04 | 5.842E+00 |
| 2095 | 8.084E+04 | 4.416E+07 | 2.967E+03 | 3.055E+02 | 8.523E+04 | 5.727E+00 |
| 2096 | 7.924E+04 | 4.329E+07 | 2.908E+03 | 2.995E+02 | 8.354E+04 | 5.613E+00 |
| 2097 | 7.767E+04 | 4.243E+07 | 2.851E+03 | 2.935E+02 | 8.189E+04 | 5.502E+00 |
| 2098 | 7.613E+04 | 4.159E+07 | 2.794E+03 | 2.877E+02 | 8.027E+04 | 5.393E+00 |
| 2099 | 7.462E+04 | 4.077E+07 | 2.739E+03 | 2.820E+02 | 7.868E+04 | 5.286E+00 |
| 2100 | 7.314E+04 | 3.996E+07 | 2.685E+03 | 2.764E+02 | 7.712E+04 | 5.182E+00 |
| 2101 | 7.170E+04 | 3.917E+07 | 2.632E+03 | 2.710E+02 | 7.559E+04 | 5.079E+00 |
| 2102 | 7.028E+04 | 3.839E+07 | 2.580E+03 | 2.656E+02 | 7.410E+04 | 4.979E+00 |
| 2103 | 6.888E+04 | 3.763E+07 | 2.528E+03 | 2.603E+02 | 7.263E+04 | 4.880E+00 |
| 2104 | 6.752E+04 | 3.689E+07 | 2.478E+03 | 2.552E+02 | 7.119E+04 | 4.783E+00 |
| 2105 | 6.618E+04 | 3.616E+07 | 2.429E+03 | 2.501E+02 | 6.978E+04 | 4.689E+00 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2106 | 6.487E+04 | 3.544E+07 | 2.381E+03 | 2.452E+02 | 6.840E+04 | 4.596E+00 |
| 2107 | 6.359E+04 | 3.474E+07 | 2.334E+03 | 2.403E+02 | 6.704E+04 | 4.505E+00 |
| 2108 | 6.233E+04 | 3.405E+07 | 2.288E+03 | 2.356E+02 | 6.572E+04 | 4.416E+00 |
| 2109 | 6.109E+04 | 3.338E+07 | 2.243E+03 | 2.309E+02 | 6.442E+04 | 4.328E+00 |
| 2110 | 5.989E+04 | 3.272E+07 | 2.198E+03 | 2.263E+02 | 6.314E+04 | 4.242E+00 |
| 2111 | 5.870E+04 | 3.207E+07 | 2.155E+03 | 2.218E+02 | 6.189E+04 | 4.158E+00 |
| 2112 | 5.754E+04 | 3.143E+07 | 2.112E+03 | 2.175E+02 | 6.066E+04 | 4.076E+00 |
| 2113 | 5.640E+04 | 3.081E+07 | 2.070E+03 | 2.131E+02 | 5.946E+04 | 3.995E+00 |
| 2114 | 5.528E+04 | 3.020E+07 | 2.029E+03 | 2.089E+02 | 5.829E+04 | 3.916E+00 |
| 2115 | 5.419E+04 | 2.960E+07 | 1.989E+03 | 2.048E+02 | 5.713E+04 | 3.839E+00 |
| 2116 | 5.311E+04 | 2.902E+07 | 1.950E+03 | 2.007E+02 | 5.600E+04 | 3.763E+00 |
| 2117 | 5.206E+04 | 2.844E+07 | 1.911E+03 | 1.968E+02 | 5.489E+04 | 3.688E+00 |
| 2118 | 5.103E+04 | 2.788E+07 | 1.873E+03 | 1.929E+02 | 5.380E+04 | 3.615E+00 |
| 2119 | 5.002E+04 | 2.733E+07 | 1.836E+03 | 1.890E+02 | 5.274E+04 | 3.544E+00 |
| 2120 | 4.903E+04 | 2.678E+07 | 1.800E+03 | 1.853E+02 | 5.170E+04 | 3.473E+00 |
| 2121 | 4.806E+04 | 2.625E+07 | 1.764E+03 | 1.816E+02 | 5.067E+04 | 3.405E+00 |
| 2122 | 4.711E+04 | 2.573E+07 | 1.729E+03 | 1.780E+02 | 4.967E+04 | 3.337E+00 |
| 2123 | 4.617E+04 | 2.523E+07 | 1.695E+03 | 1.745E+02 | 4.868E+04 | 3.271E+00 |
| 2124 | 4.526E+04 | 2.473E+07 | 1.661E+03 | 1.711E+02 | 4.772E+04 | 3.206E+00 |
| 2125 | 4.436E+04 | 2.424E+07 | 1.628E+03 | 1.677E+02 | 4.678E+04 | 3.143E+00 |
| 2126 | 4.349E+04 | 2.376E+07 | 1.596E+03 | 1.643E+02 | 4.585E+04 | 3.081E+00 |
| 2127 | 4.262E+04 | 2.329E+07 | 1.565E+03 | 1.611E+02 | 4.494E+04 | 3.020E+00 |
| 2128 | 4.178E+04 | 2.282E+07 | 1.534E+03 | 1.579E+02 | 4.405E+04 | 2.960E+00 |
| 2129 | 4.095E+04 | 2.237E+07 | 1.503E+03 | 1.548E+02 | 4.318E+04 | 2.901E+00 |
| 2130 | 4.014E+04 | 2.193E+07 | 1.473E+03 | 1.517E+02 | 4.232E+04 | 2.844E+00 |
| 2131 | 3.935E+04 | 2.150E+07 | 1.444E+03 | 1.487E+02 | 4.149E+04 | 2.787E+00 |
| 2132 | 3.857E+04 | 2.107E+07 | 1.416E+03 | 1.458E+02 | 4.066E+04 | 2.732E+00 |
| 2133 | 3.780E+04 | 2.065E+07 | 1.388E+03 | 1.429E+02 | 3.986E+04 | 2.678E+00 |
| 2134 | 3.706E+04 | 2.024E+07 | 1.360E+03 | 1.400E+02 | 3.907E+04 | 2.625E+00 |
| 2135 | 3.632E+04 | 1.984E+07 | 1.333E+03 | 1.373E+02 | 3.830E+04 | 2.573E+00 |
| 2136 | 3.560E+04 | 1.945E+07 | 1.307E+03 | 1.346E+02 | 3.754E+04 | 2.522E+00 |
| 2137 | 3.490E+04 | 1.906E+07 | 1.281E+03 | 1.319E+02 | 3.679E+04 | 2.472E+00 |
| 2138 | 3.421E+04 | 1.869E+07 | 1.256E+03 | 1.293E+02 | 3.607E+04 | 2.423E+00 |
| 2139 | 3.353E+04 | 1.832E+07 | 1.231E+03 | 1.267E+02 | 3.535E+04 | 2.375E+00 |
| 2140 | 3.287E+04 | 1.795E+07 | 1.206E+03 | 1.242E+02 | 3.465E+04 | 2.328E+00 |
| 2141 | 3.221E+04 | 1.760E+07 | 1.182E+03 | 1.218E+02 | 3.397E+04 | 2.282E+00 |
| 2142 | 3.158E+04 | 1.725E+07 | 1.159E+03 | 1.193E+02 | 3.329E+04 | 2.237E+00 |
| 2143 | 3.095E+04 | 1.691E+07 | 1.136E+03 | 1.170E+02 | 3.263E+04 | 2.193E+00 |
| 2144 | 3.034E+04 | 1.657E+07 | 1.114E+03 | 1.147E+02 | 3.199E+04 | 2.149E+00 |
| 2145 | 2.974E+04 | 1.625E+07 | 1.092E+03 | 1.124E+02 | 3.135E+04 | 2.107E+00 |

# Appendix F

## 5-Year NMOC Emissions Rate Report
## January 2014 (excerpt)

SCS ENGINEERS

# FIVE-YEAR NMOC EMISSION ESTIMATE REPORT
# TEKOI LANDFILL
# SKULL VALLEY INDIAN RESERVATION
# TOOELE COUNTY, UTAH

Presented to:


Waste Management of Utah, Inc.
3683 S. 4975 W.
West Haven, UT 84401
(801) 731-1406


Presented by:


**SCS ENGINEERS**
3117 Fite Circle, Suite 108
Sacramento, CA 95827
(916) 361-1297



January 2014
File No. 01207310.00 Task 27



**Offices Nationwide**
**www.scsengineers.com**

# FIVE-YEAR NMOC EMISSION ESTIMATE REPORT
# TEKOI LANDFILL
# SKULL VALLEY INDIAN RESERVATION
# TOOELE COUNTY, UTAH

Presented To:

Waste Management of Utah, Inc.
3683 S. 4975 W.
West Haven, UT 84401
(801) 731-1406

Presented From:

**SCS ENGINEERS**
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A 2013 Tier 2 NMOC Sampling And Analysis Report, Tekoi Landfill

B Landfill Gas Emissions Model Output

This NMOC Emission Estimate Report, dated January 2014, for the Tekoi Landfill, located on the Skull Valley Indian Reservation in Utah, has been prepared and reviewed by the following:

John Henkelman
Project Professional
**SCS ENGINEERS**

Patrick Sullivan, R.E.P.A, C.P.P
Senior Vice President
**SCS ENGINEERS**

# 1 INTRODUCTION

SCS Engineers (SCS) was retained by Waste Management of Utah, Inc. (WMU) to report non-methane organic compound (NMOC) emissions for the Tekoi Landfill (Site), located on the Skull Valley Indian Reservation in Tooele County, Utah. In September and October 2013, SCS obtained a site-specific NMOC concentration using Tier 2 procedures as set forth under the landfill New Source Performance Standards (NSPS), which can be used for up to five years. This report documents the first year using the NMOC concentration obtained in 2013 and can be used for up to five years. The 2013 Tier 2 Sampling and Analysis Report is included as ***Appendix A***.

This project was conducted in accordance with the NSPS regulations within 40 Code of Federal Regulations (CFR) Part 60, Standards of Performance for New Stationary Sources, Subpart WWW for municipal solid waste (MSW) landfills.

When five years of NMOC emissions of under 50 megagrams (Mg) per year can be demonstrated using the Tier 2 NMOC analysis, annual NMOC emissions reporting is not required to show compliance with the NSPS. This report fulfills the five-year reporting requirement under the NSPS.

# 2 ESTIMATE OF NMOC EMISSIONS

Using the site-specific NMOC concentration of 965 parts per million by volume (ppmv) as hexane obtained through Tier 2 testing activities described in ***Appendix A***. NMOC emission estimates were calculated using the United States Environmental Protection Agency (U.S. EPA) Landfill Gas Emissions Model (LandGEM). A copy of the LandGEM output is provided in ***Appendix B***. Model input parameters are summarized below:

- Potential methane generation capacity ($L_0$) = 170 cubic meters per Mg of waste. This value represents the default NSPS value for estimating NMOC emissions.

- Methane generation decay rate (k) = 0.02. Per the NSPS, the k-value of 0.02 represents the methane generation decay rate for landfills in arid regions of the U.S., and is defined as an average annual rainfall of less than 25 inches of rain.

- Site-specific NMOC concentration ($C_{NMOC}$) = 965 ppmv as hexane, per Tier 2 testing activities described in ***Appendix A***. This site-specific NMOC concentration is used in lieu of the Tier 1 default NSPS value of 4,000 ppmv.

NMOC emissions were estimated using the input parameters summarized above and the expected annual waste receipts provided by the landfill operator, as shown in ***Appendix B***. These data were prepared using the actual waste receipts through 2012 and estimates of waste disposal for 2013 forward. Based on LandGEM estimates, the Site does not exceed NMOC emissions of 50 Mg per year in from 2013 to 2017. The NMOC concentration is valid for five years, so sampling must be conducted for the 2018 NMOC report. WMU will conduct another Tier 2 study, complete a Tier 3 study or begin the time schedule for full NSPS compliance

through design, installation, and operation of a gas collection and control system (GCCS) in 2018. NMOC emissions estimates for 2013 through 2017 are provided in ***Table 1***. NMOC emissions for each year are also provided in ***Appendix B***.

**Table 1 - NMOC Emissions**

| YEAR | NMOC EMISSIONS (Mg/year) |
|---|---|
| 2013 | 34.2 |
| 2014 | 37.5 |
| 2015 | 40.7 |
| 2016 | 43.7 |
| 2017 | 46.7 |

# 3 CONCLUSION

This five-year NMOC emission report has been prepared in accordance with the requirements in NSPS 40 CFR Part 60, Subpart WWW. This Tier 2 report indicates that a GCCS installation timeline will not be triggered in until after 2017. The NMOC concentration determined during the 2013 Tier 2 can be used for up to five years unless a subsequent Tier 2 study is conducted. This report demonstrates that NMOC emissions are less than 50 Mg per year for the five years the NMOC value may be used and annual NMOC reports will not be required through 2017.

# Appendix G

## Annual Compliance Certification (March 2015)

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

**ANNUAL COMPLIANCE CERTIFICATION (A-COMP)**

## A. GENERAL INFORMATION

Permit No. V-SV-00001-2010.00

Reporting Period: Beg. 3 / 1 / 2014 End. 2 / 28 / 2015

Source / Company Name Tekoi Landfill

Mailing Address: Street or P.O. Box 6976 West California Avenue

City Salt Lake City State UT ZIP 84104 -

Contact person Brad Kloos Title District Manager

Telephone (801) 731 - 5542 Ext.

Continued on next page

## B. COMPLIANCE STATUS

Describe the compliance status of each permit term for the reporting period. Copy this page as many times as necessary to cover all permit terms and conditions.

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)
**II.A. 40 CFR Part 60, Subpart A- General Provisions**

This facility is subject to the requirements of 40 CFR part 60, subpart A as stated in §60.1. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 60, subpart A.

Compliance Methods for the Above (Description and Citation):
-Permittee complies with all applicable requirements of 40 CFR part 60, subpart A.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)
**II.B. 40 CFR Part 60, Subpart WWW – Standards**

1. This facility is subject to the requirements of 40 CFR part 60, subpart WWW. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 60, subpart WWW.

Compliance Methods for the Above (Description and Citation):
-Permittee complies with all applicable requirements of 40 CFR part 60, subpart WWW

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)
**II.B. 40 CFR Part 60, Subpart WWW – Standards**

2. 40 CFR 60, Subpart WWW applies as follows:

   (a) §60.750(a) - This facility is a MSW landfill that was constructed, reconstructed or modified on or after May 30, 1991; and

   (b) §60.752(b) - This facility has a design capacity greater than 2.5 million megagrams

Compliance Methods for the Above (Description and Citation):
-Permittee complies with all applicable requirements of 40 CFR part 60, subpart WWW

Status (Check one): ___ Intermittent Compliance __X_ Continuous Compliance

---

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.C. Standards for Air Emissions**

1. The permittee shall calculate an NMOC emission rate for the landfill using the procedure and default values specified in §60.754(a)(l).

Compliance Methods for the Above (Description and Citation):
-Permittee calculated an NMOC emission rate for the landfill using the procedure and default values specified in §60.754(a)(l).

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.C. Standards for Air Emissions**

2. Tier 1: The permittee shall compare the calculated NMOC mass emission rate to the standard of 50 megagrams per year as required by §60.754(a)(2).

   (a) If the calculated NMOC emission rate is less than 50 megagrams per year using Tier 1, the permittee shall:

      (i) Submit an emission rate report as provided in 60.757(b)(l); and

      (ii) Recalculate the NMOC mass emission rate annually using the procedure and default values specified in §60.754(a)(l) and using Tier 1 as specified in §60.754(a)(2) until such time as the calculated emission rate is equal to or greater than 50 megagrams per year or the landfill is closed.

Compliance Methods for the Above (Description and Citation):
-NMOC emission rate is greater 50 megagrams per year using Tier 1, Tier 2 testing was completed

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.C. Standards for Air Emissions**

   (b) If the calculated NMOC emission rate using the default values of §60.754(a)(l) is equal to or greater than 50 megagrarns per year using Tier 1 , the permittee shall either:

(i) Comply with §60.752(b)(2) as follows:

(A) Submit a collection and control system design plan prepared by a professional engineer within 1 year; and

(B) Install a collection and control system, as specified in §60.752(b)(2)(ii)(A) or (B) and §60.752(b)(2)(iii), within 30 months after the first annual report in which the rate equals or exceeds 50 megagram per year; and

(C) Comply with the specifications for active collection systems as specified in §60.759; or

(ii) Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the procedures provided in paragraph §60.754(a)(3) and identified as Tier 2.

Compliance Methods for the Above (Description and Citation):
- Tier 2 study was completed in September 30 and October 1, 2013 and NMOC calculated using Tier 2 specifications.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.C. Standards for Air Emissions**

3. Tier 2: The permittee shall calculate a site-specific NMOC concentration as required by §60.754(a)(3) and recalculate the NMOC mass emission rate using the equations provided in §60.754(a)(l) using the average NMOC concentration from the collected samples instead of the default value in the equation in §60.754(a)( l).

(a) If the resulting NMOC mass emission rate is less than 50 megagrams per year using Tier 2, the permittee shall:

(i)Submit a periodic estimate of the emission rate report as provided in §60.757(b)(l); and

(ii) Retest the site-specific NMOC concentration every 5 years using Tier 2.

Compliance Methods for the Above (Description and Citation):
- <50 megagrams. NMOC emission rate calculated and reported annually; Tier 2 submitted on 2/11/14. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period. Tier 2 sampling is due in 2018.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.C. Standards for Air Emissions**

b) If the resulting NMOC mass emission rate is equal to or greater than 50

megagrams per year using Tier 2, the permittee shall either:

(i) Comply with §60.752(b)(2) as follows:

(A) Submit a collection and control system design plan prepared by a professional engineer within 1 year; and

(B) Install a collection and control system, as specified in §60.752(b)(2)(ii)(A) or (B) and §60.752(b)(2)(iii), within 30 months after the first annual report in which the rate equals or exceeds 50 megagram per year; ; and

(C) Comply with the specifications for active collection systems as specified in §60.759.

(ii) Determine a site-specific methane generation rate constant and recalculate the NMOC emission rate using the procedures specified in paragraph §60.754(a)(4) and identified as Tier 3.

Compliance Methods for the Above (Description and Citation):
- <50 megagrams. NMOC emission rate calculated and reported annually; Tier 2 submitted on 2/11/14. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period. Tier 2 sampling is due in 2018.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.C. Standards for Air Emissions**

Tier 3: The permittee shall determine the site-specific methane generation rate constant as required by §60.754(a)(4) and recalculate the NMOC mass emission rate using the site-specific methane generation rate constant, the NMOC concentration previously determined by Tier 2, and the equations provided in §60.754(a)(l ).

(a) If the resulting NMOC mass emission rate is less than 50 megagrams per year using Tier 3, the permittee shall:

(i) Submit a periodic emission rate report as provided in §60.757(b)(l); and

(ii) Recalculate the NMOC emission rate annually as provided in §60.757(b)(l) using the equations in paragraph §60.754(a)(l), the site-specific methane generation rate constant, and NMOC concentration rate obtained by Tier 2 every 5 years. The site-specific methane generation rate constant is performed only once, and the value obtained from this test shall be used in all subsequent annual NMOC emission rate calculations.

Compliance Methods for the Above (Description and Citation):
- <50 megagrams. NMOC emission rate calculated and reported annually; Tier 2 submitted on 2/11/14. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period. Tier 2 sampling is due in 2018. Tier 3 not applicable at this time.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II II.C. Standards for Air Emissions**

(b) If the resulting NMOC mass emission rate is equal to or greater than 50 megagrams per year using Tier 3, the permittee shall comply with §60.752(b)(2) as follows:

(A) Submit a collection and control system design plan prepared by a professional engineer within 1 year; and
(B) Install a collection and control system, as specified in §60.752(b)(2)(ii)(A) or (B) and §60.752(b)(2)(iii), within 30 months after the first annual report in which the rate equals or exceeds 50
· megagram per year; and
(C) Comply with the specifications for active collection systems as specified in §60.759.

Compliance Methods for the Above (Description and Citation):
- <50 megagrams. NMOC emission rate calculated and reported annually; Tier 2 submitted on 2/11/14. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period. Tier 2 sampling is due in 2018. Tier 3 not applicable at this time.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**Compliance Provisions [40 CFR 60.755]**

The specified methods in §60.755(a)(l)- (a)(6) shall be used to determine whether the gas collection and control system is in compliance with §60.752(b)(2)(ii).

Compliance Methods for the Above (Description and Citation):
-- Not applicable. Owner/operator will comply with above procedures for determining compliance with the gas collection system once system is required to be installed.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.E. Monitoring of Operations [40 CFR 60.756]**

The requirements of §60.756(a)- (f) shall be used to monitor the capture and control system requirements of §60.752(b)(2).

Compliance Methods for the Above (Description and Citation):
-- Not applicable. Owner/operator will comply with above procedures for determining compliance with the gas collection system once system is required to be installed.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.F. Reporting Requirements [40 CFR 60.757]**

If the NMOC emission rate equals or exceeds 50 megagrams per year, the permittee shall meet the applicable reporting requirements of §60.757(a)- (g).

Compliance Methods for the Above (Description and Citation):
- <50 megagrams. NMOC emission rate calculated and reported annually; Tier 2 submitted on 2/11/14. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period. Tier 2 sampling is due in 2018.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**II.G. Recordkeeping Requirements [40 CFR 60.758]**

The permittee shall meet the applicable recordkeeping requirements of §60.758(a)- (f).

Compliance Methods for the Above (Description and Citation):
-Owner/operator maintains for at least 5-years, up-to-date readily accessible records of the design capacity report, current amount of waste in-place and year-by-year waste acceptance rate.

- Owner/operator acknowledges requirements and will comply with the above procedures once system is required to be installed.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**III.A. 40 CFR Part 63, Subpart A - General Provisions**

This facility is subject to the requirements of 40 CFR part 63, subpart A as stated in Table 1 of 40 CFR part 63, subpart AAAA and §§63.1960 through 63.1985. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 63, subpart A.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges requirements and will comply with the above procedures once system is required to be installed.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**III.B. 40 CFR 63, Subpart AAAA - Standards**

1. This facility is subject to the requirements of 40 CFR part 63, subpart AAAA. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 63, subpart AAAA.

2. 40 CFR 63, Subpart AAAA applies as follows:

   (a) §63.1935(a)- This facility is a MSW landfill that has accepted waste since November 8, 1987 or has additional capacity for waste deposition; and

   (b) §63.1935(a)(3) -This facility has a design capacity greater than 2.5 million megagrams and is an area source MSW landfill.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges requirements and will comply with the above procedures once system is required to be installed.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): LF-1

Permit Term (Describe requirements and cross-reference)

**III.C. Non-Methane Organic Compound Emission Rate <50 Mg/year**

If the uncontrolled non-methane organic compound (NMOC) emission rate is less than 50 megagrams per year, as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the permittee shall recalculate the NMOC emission rate annually as specified in 40 CFR 60.752(b)(l) using the procedures specified in 40 CFR 60.754(a)(l) until such time as the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, or the landfill is closed.

Compliance Methods for the Above (Description and Citation):

-Tier 2 reported submitted within 180 days of Tier 1 calculated exceedance of 50 megagrams per year. <50 megagrams. NMOC emission rate calculated and reported annually; Tier 2 submitted on 2/11/14. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period. Tier 2 sampling is due in 2018.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**III.D. Non-Methane Organic Compound Emission Rate ≥ 50 Mg/year**

If the uncontrolled non-methane organic compound (NMOC) emission rate is equal to or greater than 50 megagrams per year, as calculated according to §.60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the permittee shall comply with 40 CFR part 63, subpart AAAA by meeting the standards, monitoring, recordkeeping and reporting requirements as specified in 40 CFR part 60, subpart WWW in addition to the following standards, monitoring, recordkeeping and reporting requirements that apply to the facility.

1. Standards for Air Emissions

(a) The permittee shall comply with the requirements of 40 CFR part 60, subpart WWW.

(b) If the permittee is required by 40 CFR 60.752(b)(2) of 40 CFR part 60, subpart WWW to install a collection and control system, the permittee must comply with the requirements in §§63.1960 through 63.1985, and with the general provisions as specified in Table 1 of 40 CFR part 63, subpart AAAA.

(c) For approval of collection and control systems that include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions, the permittee must follow the procedures in 40 CFR 60.752(b)(2). If alternatives have already been approved under 40 CFR part 60, subpart WWW, these alternatives can be used to comply with 40 CFR 63, subpart AAAA, except as specified in 63.1955(c).

Compliance Methods for the Above (Description and Citation):
- Not applicable. Owner/operator will comply with above regulations once system

is required to be installed.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**III.D. Non-Methane Organic Compound Emission Rate ≥ 50 Mg/year**

2. Compliance Provisions [40 CFR 63.1960]

Compliance shall be determined by the requirements of §63.1960.

Compliance Methods for the Above (Description and Citation):
-<50 megagrams. NMOC emission rate calculated and reported annually; Tier 2 submitted on 2/11/14. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period. Tier 2 sampling is due in 2018.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**III.D. Non-Methane Organic Compound Emission Rate ≥ 50 Mg/year**

3. Monitoring and Testing [40 CFR 63.1980(g)]

If the permittee adds any liquids other than leachate in a controlled fashion to the waste mass and does not comply with the bioreactor requirements in §§63.1947, 63.1955(c) and 63.1980(c) through (f) of 40 CFR part 63, subpart AAAA, the permittee must keep a record of calculations as specified in §63.1980(g).

Compliance Methods for the Above (Description and Citation):
-Not applicable. No GCCS installed. Landfill is not a bioreactor.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): E1

Permit Term (Describe requirements and cross-reference)

**III.D. Non-Methane Organic Compound Emission Rate ≥ 50 Mg/year**

4. Recordkeeping and Reporting Requirements

(a) The permittee must comply with the recordkeeping requirements as specified in

§60.758(a) of 40 CFR part 60, subpart WWW, except that the annual report described in 40 CFR §60.757(f) must be submitted every 6 months. [40 CFR 63.1980(a)]

(b) The permittee must keep records and reports as specified in the general provisions of 40 CFR part 60 and in Table 1 of 40 CFR part 63, subpart AAAA. Applicable records in the general provisions include items such as startup, shutdown and malfunction (SSM) plans and the SSM plan reports.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements. NMOC is <50 megagrams, so no GCCS is installed.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE1, IE2, and IE3

Permit Term (Describe requirements and cross-reference)

**IV.A. 40 CFRPart 63, Subpart A- General Provisions [40 CFR 63.1 - 63.16]**

This facility is subject to the requirements of 40 CFR part 63, subpart A as outlined in Table 8 of 40 CFR part 63, subpart ZZZZ. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 63, subpart A.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE1, IE2, and IE3

Permit Term (Describe requirements and cross-reference)

**IV.B. 40 CFR Part 63, Subpart ZZZZ-Standards**

1. This facility is subject to the requirements of 40 CFR part 63, subpart ZZZZ for stationary reciprocating internal combustion engines (RICE). Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 63, subpart ZZZZ.

2. 40 CFR part 63, subpart ZZZZ applies to the following stationary

   IE1: lsuzu; 55.2 hp diesel-fired compression ignition engine.
   Construction Date: Pre June 12, 2006; Manufactured 2000.
   Compliance Date: May 3, 2013.

   IE2: John Deere (6.8L); 150 hp diesel-fired compression ignition engine.
   Construction Date: Pre June 12, 2006;
   Manufactured 2002. Compliance Date: May 3,
   2013.

IE3: Subaru-Robin; 11 hp diesel-fired compression ignition engine. Construction Date: Post June 12, 2006; Manufactured 2007. Compliance Date: Upon Start-up.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE3

Permit Term (Describe requirements and cross-reference)

**IV.C. Requirements for Engine IE3**

1. The permittee must meet the requirements of 40 CFR part 63, subpart ZZZZ by meeting the requirements of 40 CFR part 60, subpart IIII, for stationary CI engines. No further requirements apply to engine unit IE3 under 40 CFR part 63.

2. Pursuant to 40 CFR part 60, subpart IIII, this engine is subject to 40 CFR part 60, subpart IIII, as it was manufactured after April 1, 2006.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE1 and IE2

Permit Term (Describe requirements and cross-reference)

**IV.D. Requirements for Engines IE1 and IE2**

1.Emission and Operating Limitations

a. Except during periods of startup, the permittee shall:

i. Change oil and filter every 1,000 hours of operation or annually, whichever comes first;
ii. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first;
iii. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

b. During periods of startup the permittee shall minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): IE1 and IE2

Permit Term (Describe requirements and cross-reference)

**IV.D. Requirements for Engines IE1 and IE2**

2. Operation and Maintenance

The permittee must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop a maintenance plan which must provide, to the extent practicable, for the maintenance and operation of the engine in a manner consistent with good air pollution control practices for minimizing emissions.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): IE1 and IE2

Permit Term (Describe requirements and cross-reference)

**IV.D. Requirements for Engines IE1 and IE2**

3. Compliance Requirements

a. The permittee must:

i. Be in compliance with the emission limitations and operating limitations, which apply, at all times.

ii. Operate and maintain the engines, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions, at all times.

iii. Demonstrate continuous compliance with each emission limitation and operating limitation that apply.

b. For new, reconstructed, and rebuilt stationary RICE, deviations from the emission or operating limitations that occur during the first 200 hours of operation from engine startup (engine burn-in period) are not violations. Rebuilt stationary RICE means a stationary RICE that has been rebuilt as that term is defined in 40 CFR 94.11(a).

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): IE1 and IE2

Permit Term (Describe requirements and cross-reference)

**IV.D. Requirements for Engines IE1 and IE2**

4. Recordkeeping

a. The permittee must keep records of operation and maintenance to show continuous compliance with each emission or operating limitation and to demonstrate that the engine was operated and maintained according to the required maintenance plan.

b. Records must be in a form suitable and readily available for expeditious review according to §63.10(b)(l).

c. Each record must be kept for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

d. Each record must be readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.1O(b)(1).

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE1, IE2, and IE3

Permit Term (Describe requirements and cross-reference)

**V. 40 CFR Part 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines**

**V.A. 40 CFR 60, Subpart A- General Provisions [40 CFR 60.1 - 60.19]**

This facility is subject to the requirements of 40 CFR part 60, subpart A as outlined in Table 8 of 40 CFR 60, subpart IIII Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 60, subpart A.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): _ __ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE1, IE2, and IE3

Permit Term (Describe requirements and cross-reference)

**V.B. 40 CFR 60, Subpart IIII-Standards**

1. This facility is subject to the requirements of 40 CFR part 60, subpart IIII. Notwithstanding conditions in this permit, the permittee shall comply with all applicable requirements of 40 CFR part 60, subpart IIII.

2. 40 CFR part 60, subpart IIII applies to the following engines:

1El: Isuzu; 55.2 hp diesel-fired compression ignition engine. Model Year: Pre 2007; Manufactured 2000. Compliance Date: May 3, 2013.

IE2: John Deere (6.8L); 150 hp diesel-fired compression ignition engine; EPA Tier 2 Certified for NOx. Model Year: Pre 2007; Manufactured 2002. Compliance Date: May 3, 2013.

IE3: Subaru-Robin; 11 hp diesel-fired compression ignition engine. Model Year: 2007; Manufactured 2007. Compliance Date: Upon Start-up.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE1, IE2, and IE3

Permit Term (Describe requirements and cross-reference)-

**V.C. Requirements for Engines IE1 and IE2**

1. Emission Standards

The permittee, as an owner or operator of pre-2007 model year non-emergency stationary compression ignition internal combustion engines (CI ICE) with a displacement of less than 10 liters per cylinder, must comply with the emission standards in the permit.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE1, IE2, and IE3

Permit Term (Describe requirements and cross-reference)

**Compliance Requirements**

a. The permittee, as the owner or operator of the CI ICE, must

i. Comply with the emission standards;

ii. Operate and maintain the stationary CI internal combustion engine and control

device according to the manufacturer's written instructions or procedures developed and approved by the engine manufacturer;

iii. Only change those settings that are permitted by the manufacturer; and

iv. Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

b. The permittee, as the owner or operator of a pre-2007 model year stationary CI ICE who must comply with the emission standards specified in §60.4204(a), must demonstrate compliance according to one of the following methods:

i. Purchase an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications;

ii Keep records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in 40 CFR part 60, subpart IIII and these methods must have been followed correctly;

iii. Keep records of engine manufacturer data indicating compliance with the standards;

iv. Keep records of control device vendor data indicating compliance with the standards; or

v. Conduct an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in §60.4212, as applicable.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID IE3

Permit Term (Describe requirements and cross-reference)

**V.D. Requirements for Engine IE3**

1. Emission Standards

a. The permittee, as the owner or operator of 2007 model year and later non-emergency stationary CI ICE with a displacement of less than 30 liters per cylinder, must comply with the manufacturer certification emission standards for new CI ICE in §60.4201 for their 2007 model year and later stationary CI ICE, as applicable.

b. Stationary CI ICE manufacturers must certify their 2007 model year and later non-emergency stationary CI ICE with a maximum engine power less than or equal to 3,000 hp and a displacement of less than 10 liters per cylinder to the certification emission standards for new non-road CI engines in 40 CFR 89.112, 40 CFR 89.113, 40 CFR 1039.101,40 CFR 1039.102, 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR

1039.107, and 40 CFR I 039. I 15, as applicable, for all pollutants, for the same model year and maximum engine power.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE3

Permit Term (Describe requirements and cross-reference)

**V.D. Requirements for Engine IE3**

2.Fuel Usage Requirements

Beginning October 1, 2010, the permittee, as an owner or operator of stationary CI ICE subject to 40 CFR part 60, subpart IIII with a displacement of less than 30 liters per cylinder that use diesel fuel, must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): IE3

Permit Term (Describe requirements and cross-reference)

**V.D. Requirements for Engine IE3**

Compliance Requirements

a. The permittee, as an owner or operator of stationary CI ICE subject to 40 CFR part 60. subpart III, must meet the following compliance requirements:

i. Comply with the emission standards;

ii. Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed and approved by the engine manufacturer;

iii. Only change those settings that are permitted by the manufacturer; and

iv. Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

b. The permittee, as an owner or operator of a 2007 model year and later stationary CI internal combustion engine, must comply by purchasing an engine certified to the emission standards in §60.4204(b), as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VI.A. General Recordkeeping Requirements [40 CFR 71.6(a)(3)(ii) and 63.10(b)(3)]**

The permittee shall comply with the following generally applicable recordkeeping requirements:

1. If the permittee determines that his or her stationary source that emits (or has the potential to emit, without federally recognized controls) one or more hazardous air pollutants that is not subject to a relevant standard or other requirement established under 40 CFR part 63, the permittee shall keep a record of the applicability determination on site at the source for a period of five (5) years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The record of the applicability determination shall include an analysis (or other information) that demonstrates why the permittee believes the source is unaffected (e.g., because the source is an area source)

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VI.B. General Reporting Requirements [40 CFR 71.6(a)(3)(iii)]**

I. The permittee shall submit to the EPA Regional Office all reports of any required monitoring under this permit semi-annually. Reports shall be submitted by April 1st and October 1st of each year. The report due on April 1st shall cover the six- month period ending on the last day of February before the report is due. The report due on October 1st shall cover the six-month period ending on the last day of August before the report
is due. All instances of deviations from permit requirements shall be clearly identified in such reports.

Compliance Methods for the Above (Description and Citation):
-Owner operator submits reports of required monitoring in accordance with general reporting requirements outlined above.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

VI.A. General Recordkeeping Requirements [40 CFR 71.6(a)(3)(ii) and 63.10(b)(3)]

3. The permittee shall promptly report to the EPA Regional Office any deviations from permit requirements, including those attributable to upset conditions as defined in this permit, the probable cause of such deviations, and any corrective actions or preventive measures taken. "Prompt" is defined as follows:

(a) Any definition of "prompt" or a specific timeframe for reporting deviations provided in an underlying applicable requirement as identified in this permit; or

(b) Where the underlying applicable requirement fails to address the time frame for repotting deviations, reports of deviations will be submitted based on the following schedule:

> (i) For emissions of a hazardous air pollutant or a toxic air pollutant (as identified in the applicable regulation) that continue for more than an hour in excess of permit requirements, the report shall be made within 24 hours of the occurrence;
>
> (ii) For emissions of any regulated air pollutant, excluding a hazardous air pollutant or a toxic air pollutant that continue for more than two (2) hours in excess of permit requirements, the report shall be made within 48 hours; and
>
> (iii) For all other deviations from permit requirements, the repo1t shall be submitted with the semi-annual monitoring.

(c) If either of the conditions in (i) and (ii) above is met, the source shall notify EPA by telephone (1-800-227-8917) or facsimile (303-312-6064) based on the timetables listed above. All deviations reported under this section must also be identified in the 6-month report.

Compliance Methods for the Above (Description and Citation):
-No deviations occurred during the reporting period and owner/operator acknowledges and complies with the applicable requirements.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VI.C. Permit Shield [40 CFR 71.6(f)(3)]**

1. Nothing in this permit shall alter or affect the following:

(a) The liability of a permittee for any violation of applicable requirements prior to or at the time of permit issuance;

(b) The ability of the EPA to obtain information under Section 114 of the CAA; or

(c) The provisions of Section 303 of the CAA (emergency orders), including the authority of the Administrator under that section.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference) –

**VII.A. Annual Fee Payment [40 CFR 71.6(a)(7) and 40 CFR 71.9]**

1. The permittee shall pay an annual permit fee in accordance with the procedures outlined below.

2. The permittee shall pay the annual permit fee each year no later than April 1. The annual fee shall be based on the previous calendar year (January 1 - December 31).

3. The fee payment shall be in United States currency and shall be paid by money order, bank draft, certified check, corporate check, or electronic funds transfer payable to the order of the U.S. Environmental Protection Agency.

4. The permittee shall send fee payment and a co completed fee filing form to address included in permit

5. The permittee shall send an updated fee calculation worksheet form and a photocopy of each fee payment check (or other confirmation of actual fee paid) submitted annually by the same deadline as required for fee payment.

Compliance Methods for the Above (Description and Citation):
-Owner/operator paid 2014 fees in accordance with the procedures outlined above

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.A. Annual Fee Payment [40 CFR 71.6(a)(7) and 40 CFR 71.9]**

6. Basis for calculating annual fee

(a) The annual emissions fee shall be calculated by multiplying the total tons of actual emissions of all "regulated pollutants (for fee calculation' emitted from the source by the presumptive emissions fee (in dollars/ton) in effect at the time of calculation.

(i) "Actual emissions" means the actual rate of emissions in tpy of any regulated pollutant (for fee calculation) emitted from a part 71 source over the preceding

calendar year. Actual emissions shall be calculated using each emissions units actual operating hours, production rates, in-place control equipment, and types of materials processed, stored, or com busted during the preceding calendar year.

(ii) Actual emissions shall be computed using methods required by the permit for determining compliance, such as monitoring or source testing data.

(iii) If actual emissions cannot be determined using the compliance methods in the permit, the permittee shall use other federally recognized procedures.

(b) The permittee shall exclude the following emissions from the calculation of fees:

(i) The amount of actual emissions of each regulated pollutant (for fee calculation) that the source emits in excess of 4,000 tons per year (tpy);

(ii) Actual emissions of any regulated pollutant (for fee calculation) already included in the fee calculation; and

(iii) The quantity of actual emissions (for fee calculation) of insignificant activities [defined in §71.5(c)(11)(i)] or of insignificant emissions levels from emissions units identified in the permittee's application pursuant to §71.5(c) (ll )(ii).

Compliance Methods for the Above (Description and Citation):
- Annual emissions fee calculated in accordance with the above procedures

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.A. Annual Fee Payment [40 CFR 71.6(a)(7) and 40 CFR 71.9]**

7. Fee calculation worksheets shall be certified as to truth, accuracy, and completeness by a responsible official.

Compliance Methods for the Above (Description and Citation):
-Owner/operator provided a certification as to truth, accuracy, and completeness, which was completed by a responsible official.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.A. Annual Fee Payment [40 CFR 71.6(a)(7) and 40 CFR 71.9]**

8. The permittee shall retain fee calculation worksheets and other emissions-related data used to determine fee payment for 5 years following submittal of fee payment.

[Emission-related data include, for example, emissions-related forms provided by EPA and used by the permittee for fee calculation purposes, emissions-related spreadsheets, and emissions-related data, such as records of emissions monitoring data and related support information required to be kept in accordance with §71.6(a)(3)(ii).

Compliance Methods for the Above (Description and Citation):
-Owner/operator maintains documentation associated with the calculation and payment of the annual fees for 5 years and in accordance with §71.6(a)(3)(ii)

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.A. Annual Fee Payment [40 CFR 71.6(a)(7) an40 CFR 71.9**]

9. Failure of the permittee to pay fees in a timely manner shall subject the permittee to assessment of penalties and interest in accordance with §71.9(1).

Compliance Methods for the Above (Description and Citation):
-Owner/operator paid 2014 fees on time.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.A. Annual Fee Payment [40 CFR 71.6(a)(7) an40 CFR 71.9]**

10. When notified by EPA of underpayment of fees, the permittee shall remit full payment within 30 days of receipt of notification.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and will comply with the requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.A. Annual Fee Payment [40 CFR 71.6(a)(7) an40 CFR 71.9]**

11. A permittee who thinks an EPA assessed fee is in error and who wishes to challenge such fee, shall provide a written explanation of the alleged error to EPA

along with full payment of the EPA assessed fee.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and will comply with the requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.B. Annual Emissions Inventory [40 CFR 71.9(h)(l)and (2)]**

The permittee shall submit an annual emissions report of its actual emissions for both criteria pollutants and regulated HAPs for this facility for the preceding calendar year for fee assessment purposes. The annual emissions report shall be certified by a responsible official and shall be submitted each year to EPA by April 1st.

Compliance Methods for the Above (Description and Citation):
- Owner/operator submitted an annual emissions report for applicable criteria pollutants and regulated HAPs prior to April 2014 for 2013 emissions; an emissions inventory will be submitted in by April 1st 2015 for 2014 emissions. The emissions report included a CTAC signed by responsible official.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.C. Compliance Requirements**

1. Compliance with the Permit

(a) The permittee must comply with all conditions of this part 71 permit. Any permit noncompliance constitutes a violation of the CAA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

(b) It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(c) For the purpose of submitting compliance certifications or establishing whether or not a person has violated or is in violation of any requirement of

this permit, nothing shall preclude the use, including the exclusive use, of any credible evidence or information, relevant to whether a source would have been in compliance with applicable requirements if the appropriate performance or compliance test or procedure had been performed.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**2. Compliance Schedule**

(a) For applicable requirements with which the source is in compliance, the source will continue to comply with such requirements.

(b) For applicable requirements that will become effective during the permit term, the source shall meet such requirements on a timely basis.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**3. Compliance Certifications**

(a) The permittee shall submit to EPA a certification of compliance with permit terms and conditions, including emission limitations, standards, or work practices annually on April 1st. The certification of compliance shall cover the previous calendar year.

(b) The compliance certification shall be certified as to truth, accuracy, and completeness by a responsible official consistent with §71.5(d).

(c) The certification shall include the following:

(i) Identification of each permit term or condition that is the basis of the certification;

(ii) The identification of the method(s) or other means used for determining the compliance status of each term and condition during the certification period,

and whether such methods or other means provide continuous or intermittent data. Such methods and other means shall include, at a minimum, the methods and means required in this permit. If necessary, the permittee also shall identify any other material information that must be included in the certification to comply with Section 113(c)(2) of the CAA, which prohibits knowingly making a false certification or omitting material information;

(iii) The status of compliance with each term and condition of the permit for the period covered by the certification shall be based on the method or means designated above. The certification shall identify each deviation and take it into account in the compliance certification;

(iv) Such other facts as the EPA may require to determine the compliance status of the source; and

(v) Whether compliance with each permit term was continuous or intermittent.

Compliance Methods for the Above (Description and Citation):
-Owner/operator has submitted a certification of compliance with permit terms and conditions, on April 1st for the reporting of March 1, 2013 through February 28, 2014. A certification by a responsible official has been included.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.D. Duty to Provide and Supplement Information**

1 . The permittee shall furnish to EPA, within a reasonable time, any information that EPA may request in writing to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with the permit. Upon request, the permittee shall also furnish to the EPA copies of records that are required to be kept pursuant to the terms of the permit, including information claimed to be confidential. Information claimed to be confidential must be accompanied by a claim of confidentiality according to the provisions of 40 CFR part 2, subpart B.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.D. Duty to Provide and Supplement Information**

2. The permittee, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the permit application, shall promptly submit such supplementary facts or corrected information. In addition, a permittee shall provide additional information as necessary to address any requirements that become applicable after the date a complete application is filed, but prior to release of a draft permit.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.E. Submissions [40 CFR 71.5(d), 71.6(c)(l) and 71.9(h)(2)]**

1. Any document (application form, report, compliance certification, etc.) required to be submitted under this permit shall be certified by a responsible official as to truth, accuracy, and completeness. Such certifications shall state that based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Compliance Methods for the Above (Description and Citation):
- Owner/operator will provide a certification as to truth, accuracy and completeness with each document required to be submitted by this permit.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.F. Severability Clause [40 CFR 71.6(a)(5)]**

The provisions of this permit are severable, and in the event of any challenge to any portion of this permit, or if any portion is held invalid, the remaining permit conditions shall remain valid and in force.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.G. Permit Actions [40 CFR 71.6(a)(6)(iii)]**

This permit may be modified, revoked, reopened, and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.H. Administrative Permit Amendments [40 CFR 71.7(d)]**

1. The permittee may request the use of administrative permit amendment procedures for a permit revision that:

(a) Corrects typographical errors;

(b) Identifies a change in the name, address, or phone number of any person identified in the permit, or provides a similar minor administrative change at the source;

(c) Requires more frequent monitoring or reporting by the permittee;

(d) Allows for a change in ownership or operational control of a source where the EPA determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee has been submitted to the EPA;

(e) Incorporates into the part 71 permit the requirements from preconstruction review permits authorized under an EPA-approved program, provided that such a program meets procedural requirements substantially equivalent to the requirements of §§71.7 and 71.8 that would be applicable to the change if it were subject to review as a permit modification, and compliance requirements substantially equivalent to those contained in §71.6; or

(f) Incorporates any other type of change which EPA has determined to be similar to those listed above in subparagraphs (a) through (e) above.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.I. Minor Permit Modifications [40 CFR 71.7(e)(I)]**

1. The permittee may request the use of minor permit modification procedures only for those modifications that:

(a) Do not violate any applicable requirement;

(b) Do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

(c) Do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient impacts, or a visibility or increment analysis;

(d) Do not seek to establish or change a permit term or condition for which there is no corresponding underlying applicable requirement and that the source has assumed to avoid an applicable requirement to which the source would otherwise be subject. Such terms and conditions include:

> (i) A federally enforceable emissions cap assumed to avoid classification as a modification under any provision of Title V; and (ii)An alternative emissions limit approved pursuant to regulations promulgated under Section 112(i)(5) of the CAA;

(e) Are not modifications under any provision of title I of the CAA; and

(f) Are not required to be processed as a significant modification.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

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Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.I. Minor Permit Modifications [40 CFR 71.7(e)(I)]**

2. Notwithstanding the list of changes ineligible for minor permit modification procedures above, minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in an applicable implementation plan or in applicable requirements promulgated by EPA.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

**VII.I. Minor Permit Modifications [40 CFR 71.7(e)(I)]**

Permit Term (Describe requirements and cross-reference)

3. An application requesting the use of minor permit modification procedures shall meet the requirements of §71.5(c) and shall include the following:

(a) A description of the change, the emissions resulting from the change, and any new applicable requirements that will apply if the change occurs;

(b) The source's suggested draft permit;

(c) Certification by a responsible official, consistent with §71.5(d), that the proposed modification meets the criteria for use of minor permit modification procedures and a request that such procedures be used and

(d) Completed forms for the permitting authority to use to notify affected States as required under §71.8.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility-Wide

Permit Term (Describe requirements and cross-reference)

**VII.I. Minor Permit Modifications [40 CFR 71.7(e)(I)]**

4. The source may make the change proposed in its minor permit modification application immediately after it files such application. After the source makes the change allowed by the preceding sentence, and until the permitting authority takes any of the actions authorized by §71.7(e)(I)(iv)(A) through (C), the source must comply with both the applicable requirements governing the change and the proposed permit terms and conditions. During this time period, the source need not comply with the existing permit terms and conditions it seeks to modify. However, if the source fails to comply with its proposed permit terms and conditions during this time period, the existing permit terms and conditions it seeks to modify may be enforced against it.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.I. Minor Permit Modifications [40 CFR 71.7(e)(I)]**

5. The permit shield under §71.6(f) may not extend to minor permit modifications.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.J. Group Processing of Minor Permit Modifications. [40 CFR 71.7(e)(2)]**

1. Group processing of modifications by EPA may be used only for those permit modifications:

(a) That meet the criteria for minor permit modification procedures under this permit and

(b) That collectively are below the threshold level of 10 percent of the emissions allowed by the permit for the emissions unit for which the change is requested,
20 percent of the applicable definition of major source in §71.2, or 5 tpy per year, whichever is least.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.J. Group Processing of Minor Permit Modifications. [40 CFR 71.7(e)(2)]**

2. An application requesting the use of group processing procedures shall be submitted to EPA, shall meet the requirements of §71.5(c), and shall include the following:

(a) A description of the change, the emissions resulting from the change, and any new applicable requirements that will apply if the change occurs

(b) The source's suggested draft permit

(c) Certification by a responsible official , consistent with §71.5(d), that the

proposed modification meets the criteria for use of group processing procedures and a request that such procedures be used

(d) A list of the source's other pending applications awaiting group processing, and a determination of whether the requested modification, aggregated with these other applications, equals or exceeds the threshold set under the subparagraph above; and

(e) Completed forms for the permitting authority to use to notify affected States as required under §71.8.

Compliance Methods for Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.J. Group Processing of Minor Permit Modifications. [40 CFR 71.7(e)(2)]**

3. The source may make the change proposed in its minor permit modification application immediately after it files such application. After the source makes the change allowed by the preceding sentence, and until the permitting authority takes any of the actions authorized by §71.7(e)(l)(iv)(A) through (C), the source must comply with both the applicable requirements governing the change and the proposed permit terms and conditions. During this time period, the source need not comply with the existing permit terms and conditions it seeks to modify. However, if the source fails to comply with its proposed permit terms and conditions during this time period, the existing permit terms and conditions it seeks to modify may be enforced against it.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.J. Group Processing of Minor Permit Modifications. [40 CFR 71.7(e)(2)]**

4. The permit shield under §71.6(f) may not extend to group processing of minor permit modifications.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.K. Significant Permit Modifications**

1. The permittee must request the use of significant permit modification procedures for those modifications that:

(a) Do not qualify as minor permit modifications or as administrative amendments;
(b) Are significant changes in existing monitoring permit terms or conditions; or
(c) Are relaxations of reporting or recordkeeping permit terms or conditions.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.K. Significant Permit Modifications**

2. Nothing herein shall be construed to preclude the permittee from making changes consistent with part 71 that would render existing permit compliance terms and conditions irrelevant.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.K. Significant Permit Modifications [40 CFR 71.7(e)(3)]**

3. Permittees must meet all requirements of part 71 for applications, public participation, and review by affected states and tribes for significant permit modifications. For the application to be determined complete, the permittee must supply all information that is required by §71.5(c) for permit issuance and renewal, but only that information that is related to the proposed change.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.L. Reopening for Cause [(40 CFR 71.7(f)]**

The permit may be reopened and revised prior to expiration under any of the following circumstances:

(a) Additional applicable requirements under the Act become applicable to a major part 71 source with a remaining permit term of 3 or more years. Such a reopening shall be completed no later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions have been extended pursuant to §71.7(c)(3);

(b) Additional requirements (including excess emissions requirements) become applicable to an affected source under the acid rain program. Upon approval by the Administrator, excess emissions offset plans shall be deemed to be incorporated into the permit;

(c) EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit; or

(d) EPA determines that the permit must be revised or revoked to assure compliance with the applicable requirements.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.M. Property Rights [40 CFR 71.6(a)(6)(iv)]**

This permit does not convey any property rights of any sort, or any exclusive privilege.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.N. Inspection and Entry [(40 CFR 71.6(c)(2)]**

Upon presentation of credentials and other documents as may be required by law, the permittee shall allow EPA or an authorized representative to perform the following:

1. Enter upon the permittee's premises where a part 71 source is located or emissions-related activity is conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and

4. As authorized by the CAA, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit or applicable requirements.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.O. Emergency Provisions [40 CFR 71.6(g)]**

1. In addition to any emergency or upset provision contained in any applicable requirement, th3 permittee may seek to establish that noncompliance with a technology-based emission limitation under this permit was due to an emergency. To do so, the permittee shall demonstrate the affirmative defense of emergency through properly signed, contemporaneous operating logs, or other relevant evidence that:

(a) An emergency occurred and that the permittee can identify the cause(s) of the emergency;

(b) The permitted facility was at the time being properly operated;

(c) During the period of the emergency the permittee took all reasonable steps to minimize levels of emissions that exceeded the emissions standards, or other requirements in this permit; and

(d) The permittee submitted notice of the emergency to EPA within 2 working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and corrective actions taken. This notice fulfills the requirements for prompt notification of deviations.

2. In any enforcement preceding the permittee attempting to establish the occurrence

of an emergency has the burden of proof.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.P. Transfer of Ownership or Operation [40 CFR 71.7(d)(l)(iv)]**

A change in ownership or operational control of this facility may be treated as an administrative permit amendment if the EPA determines no other change in this permit is necessary and provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee has been submitted to EPA.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.Q. Off Permit Changes [40 CFR 71.6(a)(l2) and 40 CFR 71.6(a)(3)(ii)]**

The permittee is allowed to make certain changes without a permit revision, provided that the following requirements are met:

1. Each change is not addressed or prohibited by this permit;

2. Each change shall meet with all applicable requirements and shall not violate any existing permit term or condition:

3. Changes under this provision may not include changes subject to any requirement of 40 CFR parts 72 through 78 or modifications under any provision of Title I of the CAA;

4. The permittee must provide contemporaneous written notice to EPA of each change, except for changes that qualify as insignificant activities under §71.5(c)(l1). The written notice must describe each change, the date of the change, any change in emissions, pollutants emitted, and any applicable requirements that would apply as a result of the change;

5. The permit shield does not apply to changes made under this provision; and

6. The permittee must keep a record describing all changes that result in emissions of any regulated air pollutant subject to any applicable requirement not otherwise regulated under this permit, and the emissions resulting from those changes.

7. The notice shall be kept on site and made available to EPA on request, in accordance with the general record keeping provision of this permit.

8. Submittal of the written notice required above shall not constitute a waiver, exemption, or shield from applicability of any applicable standard or PSD permitting requirements under 40 CFR 52.21 that would be triggered by the replacement of any one emission unit, or by replacement of multiple emission units.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and complies with the applicable requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.R. Permit Expiration and Renewal [40 CFR 71.5(a)(l)(iii), 71.5(a)(2), 71.5(c)(5), 71.6(a)(ll), 71.7(b), 71.7(c)(l), and 71.7(c)(3)]**

1. This permit shall expire upon the earlier occurrence of the following events:
   (a) Five (5) years elapse from the date of issuance; or
   (b) The source is issued a part 70 or part 71 permit under an EPA approved or delegated permit program.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges the requirements

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.R. Permit Expiration and Renewal [40 CFR 71.5(a)(l)(iii), 71.5(a)(2), 71.5(c)(5), 71.6(a)(ll), 71.7(b), 71.7(c)(l), and 71.7(c)(3)]**

2. Expiration of this permit terminates the permittee's right to operate unless a timely and complete permit renewal application has been submitted at least 6 months but not more than 18 months prior to the date of expiration of this permit.

Compliance Methods for the Above (Description and Citation):
-Owner/operator will submit a renewal application in accordance with the timeline outlined above.

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.R. Permit Expiration and Renewal [40 CFR 71.5(a)(l)(iii), 71.5(a)(2), 71.5(c)(5), 71.6(a)(ll), 71.7(b), 71.7(c)(l), and 71.7(c)(3)]**

3. If the permittee submits a timely and complete permit application for renewal, consistent with §71.5(a)(2), but EPA has failed to issue or deny the renewal permit, then all the terms and conditions of the permit, including any permit shield granted pursuant to §71.6(±) shall remain in effect until the renewal permit has been issued or denied.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.R. Permit Expiration and Renewal [40 CFR 71.5(a)(l)(iii), 71.5(a)(2), 71.5(c)(5), 71.6(a)(ll),71.7(b), 71.7(c)(l), and 71.7(c)(3)]**

4. The permittee's failure to have a part 71 permit is not a violation of this part until EPA takes final action on the permit renewal application. Thus protection shall cease to apply if, subsequent to the completeness determination, the permittee fails to submit any additional information identified as being needed to process the application by the deadline specified in writing by EPA.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and will comply with the requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

---

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.R. Permit Expiration and Renewal [40 CFR 71.5(a)(l)(iii), 71.5(a)(2), 71.5(c)(5), 71.6(a)(ll), 71.7(b), 71.7(c)(l), and 71.7(c)(3)]**

5. Renewal of this permit is subject to the same procedural requirements that apply to initial permit issuance, including those for public participation, affected State, and tribal review.

Compliance Methods for the Above (Description and Citation):
- Owner/operator acknowledges and will comply with the requirement

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

Emission Unit ID(s): Facility Wide

Permit Term (Describe requirements and cross-reference)

**VII.R. Permit Expiration and Renewal [40 CFR 71.5(a)(l)(iii), 71.5(a)(2), 71.5(c)(5), 71.6(a)(ll), 71.7(b), 71.7(c)(l), and 71.7(c)(3)]**

6. The application for renewal shall include the current permit number, description of permit revisions and of permit changes that occurred during the permit term, any applicable requirements that were promulgated and not incorporated into the permit during the permit term, and other information required by the application form.

Compliance Methods for the Above (Description and Citation):
-Owner/operator will provide the required information in the permit renewal application

Status (Check one): ___ Intermittent Compliance _X__ Continuous Compliance

## C. DEVIATIONS FROM PERMIT TERMS AND CONDITIONS

Report all deviations from permit terms (whether reported previously or not) that occurred during the permit term. Cross-reference deviations already reported in the six-month report. Indicate whether each deviation is a possible exception to compliance. Start and end period of each deviation should be in mo/day/yr, hr:min format (24-hour clock). Also specify the date when the written deviation report was submitted (If written report required, but not submitted, leave the date field blank).

| |
|---|
| Permit Term for Which There was a Deviation: **NA**<br><br>Emission Units (unit IDs):<br><br>Deviation Start _____/_____/_____ ____:____ End:_____/_____/_____ ____:____<br><br>Date Written Report Submitted ____/____/_____ |
| Permit Term for Which There was a Deviation:<br><br>Emission Units (unit IDs):<br><br>Deviation Start _____/_____/_____ ____:____ End:_____/_____/_____ ____:____<br><br>Date Written Report Submitted ____/____/_____ |
| Permit Term for Which There was a Deviation:<br><br>Emission Units (unit IDs):<br><br>Deviation Start _____/_____/_____ ____:____ End:_____/_____/_____ ____:____<br><br>Date Written Report Submitted ____/____/_____ |
| Permit Term for Which There was a Deviation:<br><br>Emission Units (unit IDs):<br><br>Deviation Start _____/_____/_____ ____:____ End:_____/_____/_____ ____:____<br><br>Date Written Report Submitted ____/____/_____ |

# INSTRUCTIONS FOR A-COMP
# ANNUAL COMPLIANCE CERTIFICATION

## Information Collection Burden Estimates

The public reporting and recordkeeping burden for this collection of information is estimated to average 221 hours per respondent per year. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

## DETAILED INSTRUCTIONS

Submit this form along with a certification of truth, accuracy and completeness by a responsible official on an annual basis.

## Section A (General Information)

Name and address should be consistent with information provided previously. The contact person should be a person familiar with the day-to-day operation of the facility, such as a plant site manager or other individual, who should be available to be contacted by the permitting authority. If there is more than one contact person, list the others on an attachment.

The reporting period must be at least every 12 months, but your permit may require this more frequently.

## Section B (Compliance Status)

Description of Permit Term: Include each permit terms that imposes a requirement or action (emission limitations, standards, monitoring, recordkeeping, reporting, and other requirements on one or more emission units or on the facility. You will likely have to complete this section numerous times to include all requirements in the permit.

The emissions unit ID(s) should be those defined in the permit or in section I of form GIS. If the requirements, including compliance methods, apply in the same way to multiple emission units, you may list multiple units for a particular requirement. Emission units and requirements may be grouped if they apply the same way at all units in the group, the same compliance methods apply to all, and all units have the same compliance status.

Citations to the requirements should unambiguously identify the permit term to the lowest level.

Compliance Methods: List all compliance methods (monitoring, recordkeeping and reporting) you used to determine compliance with the permit term described above. Also describe and cross-reference these compliance methods.

To describe monitoring, indicate the monitoring device, what is being monitored, averaging time, frequency, and cross-reference the permit term. To describe recordkeeping, describe the records kept, collection frequency, and cross-reference the permit term. Please indicate whether monitoring data, results, or if compliance records are be kept on-site rather than reported. To describe reporting requirements, describe what is reported, when it is reported, and cross-reference the permit term.

The citation or cross-reference here must unambiguously identify the requirement to the lowest level.

Compliance Status: For each permit requirement and its associated compliance methods, indicate whether there was intermittent or continuous compliance (check one) during the reporting period. You should consider all available information or knowledge that you have when evaluating this, including compliance methods required by the permit and Acredible evidence@ (e.g., non-reference test methods and information Areadily available@ to you). You are always free to include written explanations and other information to clarify your conclusion regarding compliance status.

You must include permit terms that were not effective or not applicable (e.g., future-effective requirements, compliance options, and alternative scenarios). You may certify to continuous compliance for these if there is no evidence of noncompliance.

Absent evidence to the contrary, you may certify continuous compliance based on the data provided by the compliance methods, provided you did not fail to perform them and there were no unexcused deviations. Any failure to meet any permit term for any period of time indicates intermittent compliance. You may also indicate "undetermined compliance," if you include the reason.

**Section C (Deviations From Permit Terms and Conditions)**

Summarize all deviations from permit terms that occurred since the last compliance certification. They may have been reported previously in-writing or they may be reported concurrently with this certification. Also include any deviations but have not yet been reported in writing.

Copy this page as many times as necessary to include all deviations that occurred during the reporting period for this compliance certification.

Deviations occur when any permit term is not met, including emission limitations, standards, monitoring, recordkeeping, reporting and other requirements. For a more detailed explanation of the term Adeviation,@ see the instructions for Form ***SIXMON***. A deviation is not necessarily a violation. Violations are determined by EPA (or its delegate Agency).

You may cross-reference deviations previously reported (e.g., in 6-month monitoring reports).

You must indicate whether each deviation is a Apossible exception to compliance.@ This is a deviation that occurs when compliance is required. A deviation that is not a "possible exception to compliance" is one that occurs when compliance is not required or it is excused by another permit term. If you indicate that a deviation is not a possible exception to compliance, briefly explain and cross-reference the permit term that allows or excuses it. Also, deviations for which the permit provides an affirmative defense (e.g., emergencies) must be identified as "possible exception to compliance" because only the permitting authority may determine if the affirmative defense applies.

If the cross-reference a deviation report that does not contain all the information requested here, you must supplement it accordingly.

You may list multiple emission units if they all had the same deviation during the same time periods. In addition, for deviations that impose requirements to the permitted facility as a whole or to all units at your facility, you may enter Afacility-wide@ in the emissions unit column.

You may indicate continuous periods of deviation that span multiple days in a single entry. Use the 24-hour clock (equivalent to military time) for reporting these times (e.g., the day starts and ends at midnight, 12 a.m., or 00:00 in military time.

Specify the date when the written deviation report was submitted to the permitting authority. Leave the date field blank if you did not submit a written deviation report during the reporting period covered by the six-month monitoring report (whether required to do so or not). It is a deviation to fail to submit a required

deviation report.

***Form CTAC (Certification of Truth, Accuracy, and Completeness by Responsible Official)***

You must complete form **CTAC** and attach it to this annual compliance certification.

# Appendix H

## Six-Month Monitoring Report (September 2015)

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 6/30/2015

Federal Operating Permit Program (40 CFR Part 71)

# CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

**A. Responsible Official**

Name: (Last) Bradley (First) Scott (MI) ____

Title Area Vice President

Street or P.O. Box 222 South Mill Avenue, Suite 333

City Tempe State AZ ZIP 85281 - ____

Telephone (480) 457 - 4810 Ext. ____ Facsimile (866) 404 - 8396

**B. Certification of Truth, Accuracy and Completeness** (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) _____

Name (typed) Scott Bradley Date: 9 / 28 / 15

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 6/30/2015

Federal Operating Permit Program (40 CFR Part 71)

**6-MONTH MONITORING REPORT (SIXMON)**

**Section A (General Information)**

Permit No. V-SV-00001-2010.00

Reporting Period: Beg. 3 / 1 / 2015 End. 8 / 31 / 2015

Source / Company Name Tekoi Landfill

Mailing Address: Street or P.O. Box 6976 West California Avenue

City Salt Lake City State CA ZIP 84104 - _____

Contact person Brad Kloos Title District Manager

Telephone (801) 731 - 5542 Ext. _____

Continued on next page

**Section B (Monitoring Report)**

Summarize all required monitoring, data, or analyses required by the permit for the reporting period. Describe and cross-reference the permit term and list the emission units (Unit IDs) where the monitoring was performed. Indicate whether a separate monitoring report is required, and if required, enter the date submitted. If submitted for the first time as an attachment to this form, assign an attachment ID, mark the attachment with that ID, and attach the report to this form.

Monitoring, Data, or Analysis (describe and cite):

**II.C. Standards for Air Emissions**

1. The permittee shall calculate an NMOC emission rate for the landfill using the procedure and default values specified in §60.754(a)(l).

-Permittee calculated an NMOC emission rate for the landfill using the procedure and default values specified in §60.754(a)(l).

Emission Units (Unit IDs): E1

Separate Report? _X__ Yes ___ No Date_3_/_10__/_2008_ Attachment ID___NA_____

Monitoring, Data, or Analysis (describe and cite):

**II.C. Standards for Air Emissions**

(b) If the calculated NMOC emission rate using the default values of §60.754(a)(l) is equal to or greater than 50 megagrarns per year using Tier 1 , the permittee shall either:

(ii) Determine a site-specific NMOC concentration and recalculate the NMOC emission rate using the procedures provided in paragraph §60.754(a)(3) and identified as Tier 2.

- Tier 2 study was completed and NMOC calculated using Tier 2 specifications.

Emission Units (Unit IDs):EI

Separate Report? _X__ Yes ___ No Date__2__/11/__2014__ Attachment ID____NA_____

Monitoring, Data, or Analysis (describe and cite):

**II.C. Standards for Air Emissions**

3. Tier 2: The permittee shall calculate a site-specific NMOC concentration as required by §60.754(a)(3) and recalculate the NMOC mass emission rate using the equations provided in §60.754(a)(l) using the average NMOC concentration from the collected samples instead of the default value in the equation in §60.754(a)( l).

(a) If the resulting NMOC mass emission rate is less than 50 megagrams per year using Tier 2, the permittee shall:

(i) Submit a periodic estimate of the emission rate report as provided in §60.757(b)(l); and
(ii) Retest the site-specific NMOC concentration every 5 years using Tier 2.

- <50 megagrams. NMOC emission rate calculated and reported annually; Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period. Tier 2 sampling is due in 2018.

Emission Units (Unit IDs):EI

Separate Report? _X__ Yes ___ No Date__2__/_11_/__2014___ Attachment ID __NA

Monitoring, Data, or Analysis (describe and cite):

**II.E. Monitoring of Operations**

The requirements of §60.756(a)- (f) shall be used to monitor the capture and control system requirements of §60.752(b)(2).

-- Not applicable. Owner/operator will comply with above procedures for determining compliance with the gas collection system once system is required to be installed.

Emission Units (Unit IDs): E1

Separate Report? _____ Yes _X_ No Date____/___/_____Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**II.F. Reporting Requirements**

If the NMOC emission rate equals or exceeds 50 megagrams per year, the permittee shall meet the applicable reporting requirements of §60.757(a)- (g).

- NMOC emission rate calculated and reported annually, <50 megagrams. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period.

Emission Units (Unit IDs): E1

Separate Report? _X_____ Yes _ No Date__2/_11 /14_____Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**III.C. Non-Methane Organic Compound Emission Rate <50 Mg/year**

If the uncontrolled non-methane organic compound (NMOC) emission rate is less than 50 megagrams per year, as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the permittee shall recalculate the NMOC emission rate annually as specified in 40 CFR 60.752(b)(l) using the procedures specified in 40 CFR 60.754(a)(l) until such time as the calculated NMOC emission rate is equal to or greater than 50 megagrams per year, or the landfill is closed.

-Tier 2 reported submitted within 180 days of Tier 1 calculated exceedance of 50 megagrams per year. NMOC emission rate calculated and reported annually, <50 megagrams. Tier 2 is a 5-year report. 5-year NMOC emissions report includes this reporting period.

Emission Units (Unit IDs): LF-1
Separate Report? X Yes ___ No Date 2/ 11/14 Attachment ID ____

Monitoring, Data, or Analysis (describe and cite):

**III.D. Non-Methane Organic Compound Emission Rate ≥ 50 Mg/year**

3. Monitoring and Testing [40 CFR 63.1980(g)]

If the permittee adds any liquids other than leachate in a controlled fashion to the waste mass and does not comply with the bioreactor requirements in §§63.1947, 63.1955(c) and 63.1980(c) through (f) of 40 CFR part 63, subpart AAAA, the permittee must keep a record of calculations as specified in §63.1980(g).

-Not applicable. No GCCS installed. Landfill is not a bioreactor.

Emission Units (Unit IDs): EI

Separate Report? ___ Yes _X__ No Date____/___/_____ Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**III.D. Non-Methane Organic Compound Emission Rate ≥ 50 Mg/year**

4. Recordkeeping and Reporting Requirements

(a) The permittee must comply with the recordkeeping requirements as specified in §60.758(a) of 40 CFR part 60, subpart WWW, except that the annual report described in 40 CFR §60.757(f) must be submitted every 6 months.

(b) The permittee must keep records and reports as specified in the general provisions of 40 CFR part 60 and in Table 1 of 40 CFR part 63, subpart AAAA. Applicable records in the general provisions include items such as startup, shutdown and malfunction (SSM) plans and the SSM plan reports.

- Owner/operator maintains applicable records. No GCCS has been installed because NMOC is <50 megagrams.

Emission Units (Unit IDs): EI

Separate Report? ___ Yes _X__ No Date____/___/_____ Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**IV.D. Requirements for Engines IE1 and IE2**

**1. Emission and Operating Limitations**

a. Except during periods of startup, the permittee shall:

i. Change oil and filter every 1,000 hours of operation or annually, whichever comes first;
ii. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first;
iii. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

b. During periods of startup the permittee shall minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.

-Maintenance requirements listed above were not implemented for IE1 and IE2 during this reporting period.

Emission Units (Unit IDs): IE1 and IE2

Separate Report? ___ Yes _X__ No Date____/___/_____ Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**IV.D. Requirements for Engines IE1 and IE2**

**2. Operation and Maintenance**

The permittee must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop a maintenance plan which must provide, to the extent practicable, for the maintenance and operation of the engine in a manner consistent with good air pollution control practices for minimizing emissions.

-Records of operation are maintained for IE1 and IE2.

Emission Units (Unit IDs): IE1 and IE2

Separate Report? ___ Yes _X__ No Date____/___/_____ Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**IV.D. Requirements for Engines IE1 and IE2**

**4. Recordkeeping**

a. The permittee must keep records of operation and maintenance to show continuous compliance with each emission or operating limitation and to demonstrate that the engine was operated and maintained according to the required maintenance plan.

b. Records must be in a form suitable and readily available for expeditious review according to §63.10(b)(l).

c. Each record must be kept for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.

d. Each record must be readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to §63.1O(b)(1).

-Records of operation and maintenance are kept for IE1 and IE2.

Emission Units (Unit IDs): IE1 and IE2

Separate Report? ___ Yes _X__ No Date____/___/_____ Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**V.C. Compliance Requirements**

a. The permittee, as the owner or operator of the CI ICE, must

I. Comply with the emission standards;
II. Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed and approved by the engine manufacturer;
III. Only change those settings that are permitted by the manufacturer; and
IV. Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

b. The permittee, as the owner or operator of a pre-2007 model year stationary CI ICE who must comply with the emission standards specified in §60.4204(a), must demonstrate compliance according to one of the following methods:

i. Purchase an engine certified according to 40 CFR part 89 or 40 CFR part 94, as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications;

ii Keep records of performance test results for each pollutant for a test conducted on a similar engine. The test must have been conducted using the same methods specified in 40 CFR part 60, subpart IIII and these methods must have been followed correctly;

iii. Keep records of engine manufacturer data indicating compliance with the standards;

iv. Keep records of control device vendor data indicating compliance with the standards; or

v. Conduct an initial performance test to demonstrate compliance with the emission standards according to the requirements specified in §60.4212, as applicable.

- Owner/operator maintains appropriate records of manufacturer data indicating compliance with the standards.

Emission Units (Unit IDs): IE1, IE2, and IE3

Separate Report? ___ Yes __X_ No Date____/___/_____ Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**V.D. Requirements for Engine IE3**

Compliance Requirements

a. The permittee, as an owner or operator of stationary CI ICE subject to 40 CFR part 60. Subpart III, must meet the following compliance requirements:

i. Comply with the emission standards;

ii. Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed and approved by the engine manufacturer;

iii. Only change those settings that are permitted by the manufacturer; and

iv. Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

b. The permittee, as an owner or operator of a 2007 model year and later stationary CI internal combustion engine, must comply by purchasing an engine certified to the emission standards in §60.4204(b), as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's specifications.

- Owner/operator complies with all applicable emission standards and operational requirements; and maintains appropriate records.

Emission Units (Unit IDs): IE3

Separate Report? ___ Yes __X_ No Date____/___/_____ Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**VI.A. General Recordkeeping Requirements**

The permittee shall comply with the following generally applicable recordkeeping requirements:

1. If the permittee determines that his or her stationary source that emits (or has the potential to emit, without federally recognized controls) one or more hazardous air pollutants that is not subject to a relevant standard or other requirement established under 40 CFR part 63, the permittee shall keep a record of the applicability determination on site at the source for a period of five (5) years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The record of the applicability determination shall include an analysis (or other information) that demonstrates why the permittee believes the source is unaffected (e.g., because the source is an area source)

- Owner/operator maintains applicable appropriate records.

Emission Units (Unit IDs): Facility Wide

Separate Report? ___ Yes __X_ No Date____/___/_____ Attachment ID _____

Monitoring, Data, or Analysis (describe and cite):

**VI.A. General Recordkeeping Requirements**

3. The permittee shall promptly report to the EPA Regional Office any deviations from permit requirements, including those attributable to upset conditions as defined in this permit, the probable cause of such deviations, and any corrective actions or preventive measures taken. "Prompt" is defined as follows:

   (a) Any definition of "prompt" or a specific timeframe for reporting deviations provided in an underlying applicable requirement as identified in this permit; or

   (b) Where the underlying applicable requirement fails to address the time frame for repotting deviations, reports of deviations will be submitted based on the following schedule:

      (i) For emissions of a hazardous air pollutant or a toxic air pollutant (as identified in the applicable regulation) that continue for more than an hour in excess of permit requirements, the report shall be made within 24 hours of the occurrence;

      (ii) For emissions of any regulated air pollutant, excluding a hazardous air

pollutant or a toxic air pollutant that continue for more than two (2) hours in excess of permit requirements, the report shall be made within 48 hours; and

(iii) For all other deviations from permit requirements, the repo1t shall be submitted with the semi-annual monitoring.

(c) If either of the conditions in (i) and (ii) above is met, the source shall notify EPA by telephone (1-800-227-8917) or facsimile (303-312-6064) based on the timetables listed above. [Explanatory note: Notification by telephone or facsimile must specify that this notification is a deviation report for a part 71 permit. A written notice, certified consistent with the requirements of this permit must be submitted within ten (10) working days of the occurrence. All deviations reported under this section must also be identified in the 6-month report.

- No deviations occurred during the reporting period and owner/operator acknowledges and complies with the applicable requirements.

Emission Units (Unit IDs): Facility Wide

Separate Report? ___ Yes __X_ No Date____/___/_____ Attachment ID _____

**Section C (Deviations Already "Promptly" Reported)**

Summarize all deviations from permit terms already reported on form **PDR** during the reporting period. Copy this page as many times as necessary to include all such deviations. Describe and cross-reference the permit terms and report the start and end dates and times of the deviations (mo/day/yr, hr:min). Use the 24-hour clock. Also specify the date when the written deviation report was submitted to the permitting authority (If written report required, but not submitted, leave the date field blank). Note that failure to submit a deviation report, or late submittal, is a deviation that must be reported in the Section D.

| |
|---|
| Permit Term for Which There was a Deviation: NA<br><br>Emission Units (unit IDs):<br><br>Deviation Start _____/_____/_____ ____:____ End:_____/_____/_____ ____:____<br><br>Date Written Report Submitted ____/____/_____ |
| Permit Term for Which There was a Deviation:<br><br>Emission Units (unit IDs):<br><br>Deviation Start _____/_____/_____ ____:____ End:_____/_____/_____ ____:____<br><br>Date Written Report Submitted ____/____/_____ |
| Permit Term for Which There was a Deviation:<br><br>Emission Units (unit IDs):<br><br>Deviation Start _____/_____/_____ ____:____ End:_____/_____/_____ ____:____<br><br>Date Written Report Submitted ____/____/_____ |
| Permit Term for Which There was a Deviation:<br><br>Emission Units (unit IDs):<br><br>Deviation Start _____/_____/_____ ____:____ End:_____/_____/_____ ____:____<br><br>Date Written Report Submitted ____/____/_____ |

**Section D (Deviations Reported Semiannually)**

This section is for deviations reported for the first time in this six-month monitoring report. Describe and cross-reference the permit terms and emission units that apply to the deviation. Copy this page as many times as necessary to include all such deviations. Report the beginning and ending times (mo/day/yr, hr:min) for each deviation. Use the 24-hour clock. Briefly explain (if known) the probable cause of each deviation. If any corrective actions or preventative measures have been taken to avoid these in the future, briefly describe the measures, including when they occurred.

Permit Term (for Which There is a Deviation): NA

Emission Units (unit IDs)

Deviation Start: ____/____/_____ ____ :____ End: ____/____/_____ ____:____

Probable Cause of Deviation: Maintenance was not performed in accordance with the requirements of Condition IV.D.1.a

Corrective Actions or Preventative Measures Taken: Upon discovery of the deviation, Tekoi immediately took action and has instituted a more thorough tracking and scheduling program to ensure the monitoring requirements are implemented as required going forward.

Permit Term (for Which There is a Deviation):

Emission Units (unit IDs)

Deviation Start: ____/____/_____ ____:____ End: ____/____/_____ ____:____

Probable Cause of Deviation:

Corrective Actions or Preventative Measures Taken:

Permit Term (for Which There is a Deviation):

Emission Units (unit IDs)

Deviation Start: ____/____/_____ ____:____ End: ____/____/_____ ____:____

Probable Cause of Deviation:

Corrective Actions or Preventative Measures Taken:

# INSTRUCTIONS FOR SIXMON
# 6-MONTH MONITORING REPORT

**Information Collection Burden Estimates**

The public reporting and recordkeeping burden for this collection of information is estimated to average 221 hours per respondent per year. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

**DETAILED INSTRUCTIONS**

**Section A (General Information)**

The contact person should be a person familiar with the day-to-day operation of the facility, such as a plant site manager, who should be available to be contacted by the permitting authority. If there is more than one contact person, list the others on an attachment.

**Section B (Monitoring Report)**

Summarize all monitoring required during the reporting period and provide information on any separate monitoring reports submitted at this time or any time during the reporting period. Each individual monitoring requirement should be included in a separate row of the table. Copy section C of this form as many times as necessary to address all monitoring requirements.

Describe and cross-reference the relevant permit term that requires monitoring, data collection or analysis. Be specific with regard to test methods or analytical techniques used, and the air pollutant or parameter monitored. The cross-reference to the permit term should be as precise as possible.

Monitoring is a method of assuring compliance with permit terms. Monitoring may include instrumental or non-instrumental methods, including continuous emissions monitoring, periodic readings of parameters related to operating conditions, stack tests using EPA reference test methods, vendor or laboratory analytical testing, manual inspections, visual observations, work practice checks, and recordkeeping that confirms a requirement has been met.

You may list multiple units if all are subject to the same monitoring requirements. In addition, for monitoring that applies to the permitted facility as a whole or to all units at your source, you may enter Afacility-wide@ in the emissions unit column.

Indicate whether a separate report is required for the monitoring described above. If a separate report was submitted prior to the submittal of this form, indicate the date; if it is being submitted for the first time with this form, assign an attachment ID in the space provided, mark the attachment accordingly, and attach the separate monitoring report to this form.

**Section C (Deviations Already “Promptly” Reported)**

Summarize all deviations from permit terms reported in writing prior to the submittal of this monitoring report, such as those reported using **PDR**. Include all deviations that were required to be reported, but not reported or not reported by the deadline. Note that all deviations that occurred during the reporting period should either be reported in this section or in section D.

Deviations from permit terms occur when any permit term is not met, including emission control requirements and compliance assurance methods (monitoring, recordkeeping, and reporting). For example, the following are examples of deviations: (1) emissions that exceed an emission limit; (2) parameter value that indicates that an emission limit has not been met; (3) observations or data that show noncompliance with a limitation or other requirement; (4) an exceedance or excursion as defined in 40 CFR part 64 (CAM); (5) required monitoring that is not performed; and (6) failure to submit a report. You also must include deviations from permit terms that occur during startup, shutdown, malfunction, and upset conditions. A deviation is not necessarily a violation; violations will be determined by EPA (or its delegate Agency).

You may list multiple emission units here if they all had deviations of this permit term and they all occurred during the same time periods. In addition, you may enter Afacility-wide@ in the emissions unit column, if appropriate.

You may indicate continuous periods of deviation that span multiple days in a single entry. Use the 24-hour clock (equivalent to military time) for reporting these times (e.g., the day starts and ends at midnight, 12 a.m., or 00:00 in military time.

Specify the date when the written deviation report was submitted to the permitting authority. Leave the date field blank if you did not submit a written report during the reporting period.

It is a deviation to submit a required deviation report (whether required by telephone, fax, or in writing within 24 or 48 hours) after the deadline or to neglect to submit it at. Such deviations must be reported in Section D.

“Emergencies” (as defined in part 71) are also considered deviations. However if the reporting requirements of part 71 for emergences are met, they may not necessarily result in noncompliance. Note that although the terms Aupset,@ Astartup,@ Ashutdown,@ and Amalfunction@ refer to conditions that are not defined in part 71, the applicable requirements may define these terms, and all deviations during such conditions are deviations. Also note that the applicable requirement itself may define the term Adeviation@ or refer to Aexcess emissions;@ and any such occurrences should also be reported as deviations on this form.

**Section D (Deviations Reported Semiannually)**

Report those deviations required to be reported for the first time in this 6-month monitoring report. Note that all deviations not included in section C should be included here. Copy this page as many times as necessary to report all such deviations.

Cross-reference the permit term for which there is a deviation and describe the requirement.

List the emission units (Unit IDs) where this deviation occurred. You may list multiple units here if they all had deviations of this permit term and they all occurred during the same time periods. In addition, for deviations of permit terms that impose requirements to the permitted facility as a whole or to all units at your facility, you may enter Afacility- wide@ in the emissions unit column.

Identify the time period (beginning and ending) over which the deviation occurred. You may indicate continuous periods of deviation that span multiple days in a single entry. Use the 24-hour clock (equivalent to military time) for reporting these times (e.g., the day starts and ends at midnight, or 00:00 in military time.

Briefly explain the probable cause of the deviation from permit terms, if known. Examples of possible answers to this question include Aoperator error@ or Amechanical failure.@ Be as specific as possible.

If any corrective actions or preventative measures were taken to avoid similar deviations at the same emissions units, briefly explain them. Examples of possible answers to this question include Atrained operator on proper operation of control devices@ or Arepaired defective equipment and will perform routine maintenance on an accelerated schedule.@ If known, include dates when such actions or measures were taken or will be taken in the future.

**Form CTAC (Certification of Truth, Accuracy, and Completeness by Responsible Official)**

You must complete form **CTAC** and attach it to this monitoring report.

# Appendix I

## 2014 Annual Fee Emission Calculations (March 2015)

Environmental Consultants
and Contractors

3117 Fite Circle.
Suite 108
Sacramento, CA 95827

916-361-1297
FAX 916-361-1299
www.scsengineers.com

SCS ENGINEERS

March 27, 2015
File No. 01207310.00, Task 34

Part 71 Contact
c/o Claudia Smith
Air Permitting, Monitoring and Modeling Unit
EPA Region 8
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129
Ph: 303-312-6520

**SUBJECT: TITLE V 2014 ANNUAL EMISSION FEE CALCULATION**
**TEKOI LANDFILL, TOOELE COUNTY, UTAH**
**PERMIT NO. (V-SV-00001-2010.00)**

Dear Ms. Smith:

On behalf of Waste Management of Utah, Inc. (WM), SCS Engineers (SCS) is submitting the required forms and supporting documentation for payment of the 2014 Title V annual fees for the Tekoi Landfill located in Tooele County, Utah. This submittal is intended to satisfy the applicable requirement of the Clean Air Act (CAA) Title V regulations (40 Code of Federal Regulations (CFR), Part 71).

SCS has completed the enclosed U.S. Environmental Protection Agency (EPA) Fee Calculation Worksheet (Form FEE) to determine the facility's annual fee of $998.60 for calendar year 2014. We have used the 2015 fee rate of $49.93 per ton to determine the 2015 fees. Per Instructions for Form FEE, tables with emissions calculations are attached to Form FEE (Attachment A).

A Certification of Truth, Accuracy, and Completeness form is included in this submittal, and has been signed by a responsible official from WM. A check for the fee amount has been submitted, along with a completed EPA Fee Filing Form (Form FF), to the address indicated in the Form FF instructions. A copy of the completed Form FF, as well as a photocopy of the check, is attached per Instructions for Form FEE (Attachment B).

If you have any questions regarding this submittal or require any additional information, please contact the undersigned at (707) 546-9461.

Sincerely,

Leslie M. Bove
Project Professional
SCS ENGINEERS

Michael O'Connor
Senior Project Professional
SCS ENGINEERS

Attachments A – Form FEE and Emissions Calculations
B – Form FF and Check Copy

cc: U.S. Bank
Government Lockbox 979078
US EPA FOIA & Misc. Payments
1005 Convention Plaza
Mail Station SL-MO-C2-GL
St. Louis, MO 63101
Contact: Natalie Pearson ( U.S. Bank)
314-418-4087

Mark Franc, WM – electronic copy
Bruce Clabaugh, WM – electronic copy

# ATTACHMENT A

# FORM FEE AND EMISSIONS CALCULATIONS

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

**FEE CALCULATION WORKSHEET (FEE)**

Use this form initially, or thereafter on an annual basis, to calculate part 71 fees.

**A. General Information**

Type of fee (Check one): ___Initial _X__Annual

Deadline for submitting fee calculation worksheet __4__/__1__/_15_____

For initial fees, emissions are based on (Check one): NA

___ Actual emissions for the preceding calendar year. (Required in most circumstances.)

___ Estimates of actual emissions for the current calendar year. (Required when operations commenced during the preceding calendar year.)

Date commenced operations ____/____/_____

___ Estimates of actual emissions for the preceding calendar year. (Optional after a part 71 permit was issued to replace a part 70 permit, but only if initial fee payment is due between January 1 and March 31; otherwise use actual emissions for the preceding calendar year.)

For annual fee payment, you are required to use actual emissions for the preceding calendar year.

**B. Source Information:** Complete this section only if you are paying fees but not applying for a permit.

Source or facility name _Tekoi Landfill_____

Mailing address: Street or P.O. Box _6976 West California Avenue_____

City_Salt Lake City_____ State_UT_____ ZIP_84104_____ - _____

Contact person__Brad Kloos_____ Title___District Manager_____

Telephone (801) _731__ - _5542____ Ext_____ Part 71 permit no. _V-SV-00001-2010.00_____

**C. Certification of Truth, Accuracy and Completeness**: Only needed if not submitting a separate form CTAC.

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in this submittal (form and attachments) are true, accurate and complete.

Name (signed) __**SEE ATTACHED CTAC FORM**_____

Name (typed) _____ Date:____ /____ /_____

**D. Annual Emissions Report for Fee Calculation Purposes -- Non-HAP**

You may use this to report actual emissions (tons per year) of regulated pollutants (for fee calculation) on a calendar-year basis for both initial and annual fee calculation purposes. Section E is designed to report HAP emissions. Quantify all actual emissions, including fugitives, but do not include insignificant emissions and certain regulated air pollutants that are not counted for fee purposes, such as CO (see instructions). You may round to the nearest tenth of a ton on this form. Sum the emissions in each column and enter a subtotal at the bottom of the page. If any subtotal exceeds 4,000 tons, enter 4,000 for that column.

This data is for 2014 (year)

| Emission Unit ID | NOx | VOC | SO2 | PM10 | Lead | Other |
|---|---|---|---|---|---|---|
| E1 | | 9.5 | | | | |
| E2 | | | | 8.3 | | |
| | | | | | | |
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| | | | | | | |
| SUBTOTALS | NA | 9.5 | NA | 8.3 | NA | NA |

**E. Annual Emissions Report for Fee Calculation Purposes -- HAP**

HAP Identification. Identify individual HAP emitted at the facility, identify the CAS number, and assign a unique identifier for use in the second table in this section. Whenever assigning identifier codes, use "HAP1" for the first, "HAP2" for the second, and so on.

| Name of HAP | CAS No | Identifier |
|---|---|---|
| 1,1,1-Trichloroethane (methyl chloroform) | 71-55-6 | HAP1 |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | HAP2 |
| 1,1-Dichloroethane (ethylidene dichloride) | 75-34-3 | HAP3 |
| 1,1-Dichloroethene (vinylidene chloride) | 75-35-4 | HAP4 |
| 1,2-Dichloroethane (ethylene dichloride) | 107-06-2 | HAP5 |
| 1,2-Dichloropropane (propylene dichloride) | 78-87-5 | HAP6 |
| 1,3-Butadiene | 106-99-0 | HAP7 |
| Acetaldehyde | 75-07-0 | HAP8 |
| Acrolein | 107-02-8 | HAP9 |
| Acrylonitrile | 107-13-1 | HAP10 |
| Benzene | 71-43-2 | HAP11 |
| Carbon disulfide | 75-15-0 | HAP12 |
| Carbon tetrachloride | 56-23-5 | HAP13 |
| Carbonyl sulfide | 463-58-1 | HAP14 |
| Chlorobenzene | 108-90-7 | HAP15 |
| Chloroethane (ethyl chloride) | 75-00-3 | HAP16 |
| Chloroform | 67-66-3 | HAP17 |
| Chloromethane (methyl chloride) | 74-87-3 | HAP18 |
| Dichlorobenzene (1,4-Dichlorobenzene) | 106-46-7 | HAP19 |
| Dichloromethane (Methylene Chloride) | 75-09-2 | HAP20 |
| Ethylbenzene | 100-41-4 | HAP21 |
| Ethylene dibromide (1,2-Dibromoethane) | 106-93-4 | HAP22 |
| Formaldahyde | 60-00-0 | HAP23 |
| Hexane | 110-54-3 | HAP24 |
| Mercury (total) | 7439-97-6 | HAP25 |
| Methyl ethyl ketone | 78-93-3 | HAP26 |
| Methyl isobutyl ketone | 108-10-1 | HAP27 |
| Naphthalene | 91-20-3 | HAP28 |
| Perchloroethylene (tetrachloroethylene) | 127-18-4 | HAP29 |
| Toluene | 108-88-3 | HAP30 |
| Trichloroethylene (trichloroethene) | 79-01-6 | HAP31 |
| Vinyl chloride | 75-01-4 | HAP32 |
| Xylenes | 1330-20-7 | HAP33 |

HAP Emissions. Report the actual emissions of individual HAP identified above. Use the identifiers assigned in the table above. Include all emissions, including fugitives, and do not include insignificant emissions. You may round to the nearest tenth of a ton. Sum the emissions in each column and enter a subtotal at the bottom of the page. If any subtotal exceeds 4,000 tons, enter 4,000.

This data is for __2014_____ (year)

| Emissions Unit ID | Actual Emissions (Tons/Year) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | HAP_30 | HAP_33 | HAP___ | HAP___ | HAP___ | HAP___ | HAP___ | HAP___ |
| EI1 | 0.7 | 0.5 | | | | | | |
| | | | | | | | | |
| SUBTOTALS | 0.7 | 0.5 | | | | | | |

## F. Fee Calculation Worksheet

This section is used to calculate the total fee owed for both initial and annual fee payment purposes. Reconciliation is only for cases where you are paying the annual fee and you used any type of estimate of actual emissions when you calculated the initial fee. If you do not need to reconcile fees, only complete line 1-5 and then skip down to lines 21 – 26. See instructions for more detailed explanation.

| | |
|---|---|
| 1. Sum the emissions from section D of this form (non-HAP) and enter the total (tons). | 18 |
| 2. Sum the emissions from section E of this form (HAP) and enter the total (tons). | 2 |
| 3. Sum lines 1 and 2. | 20 |
| 4. Enter the emissions that were counted twice. If none, enter "0." | 0 |
| 5. Subtract line 4 from line 3, round to the nearest ton, and enter the result here. | 20 |

**RECONCILIATION**
**(WHEN INITIAL FEES WERE BASED ON ESTIMATES FOR THE "CURRENT" CALENDAR YEAR)**

Only complete lines 6-10 if you are paying the first annual fee and initial fees were based on estimated actual emissions for the calendar year in which you paid initial fees; otherwise skip to line 11 or to line 21.

| | |
|---|---|
| 6. Enter the total estimated actual emissions for the year the initial fee was paid (previously reported on line 5 of the initial fee form). | |
| 7. If line 5 is greater than line 6, subtract line 6 from line 5, and enter the result. Otherwise enter "0." | |
| 8. If line 6 is greater than line 5, subtract line 5 from line 6, and enter the result. Otherwise enter "0." | |
| 9. If line 7 is greater than 0, multiply line 7 by last year's fee rate ($/ton) and enter the result here. This is the underpayment. Go to line 21. | |
| 10. If line 8 is greater than 0, multiply line 8 by last year's fee rate ($/ton) and enter the result here. This is the overpayment. Go to line 21. | |

**RECONCILIATION**
**(WHEN INITIAL FEES WERE BASED ON ESTIMATES FOR THE "PRECEDING" CALENDAR YEAR)**

Only complete lines 11-20 if you are paying the first annual fee and initial fees were based on estimated actual emissions for the calendar year preceding initial fee payment; otherwise skip to line 21. If completing this section, you will also need to complete sections D and E to report actual emissions for the calendar year preceding initial fee payment.

| | |
|---|---|
| 11. Sum the actual emissions from section D (non-HAP) for the calendar year preceding initial fee payment and enter the result here. | |
| 12. Sum the actual emissions from section E (HAP) for the calendar year preceding initial fee payment and enter the result here. | |
| 13. Add lines 11 and 12 and enter the total here. These are total actual emissions for the calendar year preceding initial fee payment. | |
| 14. Enter double counted emission from line 13 here. If none, enter "0." | |
| 15. Subtract line 14 from line 13, round to the nearest ton, and enter the result here. | |

| | |
|---|---|
| 16. Enter the total estimated actual emissions previously reported on line 5 of the initial fee form. These are estimated actual emissions for the calendar year preceding initial fee payment. | |
| 17. If line 15 is greater than line 16, subtract line 16 from line 15, and enter the result here. Otherwise enter "0." | |
| 18. If line 16 is greater than line 15, subtract line 15 from line 16, and enter the result here. Otherwise enter "0." | |
| 19. If line 17 is greater than 0, multiply line 17 by last year's fee rate ($/ton) and enter the result here. This is the underpayment. | |
| 20. If line 18 is greater than 0, multiply line 18 by last year's fee rate ($/ton) and enter the result on this line. This is the overpayment. | |
| **FEE CALCULATION** | |
| 21. Multiply line 5 (tons) by the current fee rate ($/ton) and enter the result here. | $998.60 |
| 22. Enter any underpayment from line 9 or 19 here. Otherwise enter "0." | 0 |
| 23. Enter any overpayment from line 10 or 20 here. Otherwise enter "0." | 0 |
| 24. If line 22 is greater than "0," add it to line 21 and enter the result here. If line 23 is greater than "0," subtract this from line 21 and enter the result here. Otherwise enter the amount on line 21 here. This is the fee adjusted for reconciliation. | $998.60 |
| 25. If your account was credited for fee assessment error since the last time you paid fees, enter the amount of the credit here. Otherwise enter "0." | 0 |
| 26. Subtract line 25 from line 24 and enter the result here. Stop here. This is the total fee amount that you must remit to EPA. | $998.60 |

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 6/30/2015

Federal Operating Permit Program (40 CFR Part 71)

# CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

**A. Responsible Official**

Name: (Last) Bradley (First) Scott (MI) ____

Title Area Vice President

Street or P.O. Box 5500 S. Quebec St., Suite 250

City Greenwood Village State CO ZIP 80111 - ____

Telephone (303) 486 - 6013 Ext. ____ Facsimile (303) 797 - 4661

**B. Certification of Truth, Accuracy and Completeness** (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) ____

Name (typed) Scott Bradley Date: 03 / 18 / 2015

## TABLE 1. PART 71 ANNUAL SIGNIFICANT EMISSIONS FEE CALCULATIONS SUMMARY
## TEKOI LANDFILL

| Emission Source | NOx (tons/yr) | VOC (tons/yr) | SOx (tons/yr) | PM10 (tons/yr) |
|---|---|---|---|---|
| E1 | NA | 9.474 | NA | NA |
| E2 | NA | NA | NA | 8.276 |
| Total | 0.000 | 9.474 | 0.000 | 8.276 |

E1= Emission unit ID

**TABLE 2**
**LANDFILL GAS FUGITIVE EMISSIONS (E1)**
**TEKOI LANDFILL**

| CAS Number | Pollutant | Molecular Weight | Default Concentration In LFG (1) | Pollutants Generated in LFG (2) |
|---|---|---|---|---|
| | | (g/mol) | (ppmv) | (tons/year) |
| **Hazardous Air Pollutants (HAPs) (1)** | | | | |
| 71-55-6 | 1,1,1-Trichloroethane (methyl chloroform) | 133.41 | 0.168 | 6.55E-03 |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 167.85 | 0.070 | 3.43E-03 |
| 75-34-3 | 1,1-Dichloroethane (ethylidene dichloride) | 98.97 | 0.741 | 2.14E-02 |
| 75-35-4 | 1,1-Dichloroethene (vinylidene chloride) | 96.94 | 0.092 | 2.61E-03 |
| 107-06-2 | 1,2-Dichloroethane (ethylene dichloride) | 98.96 | 0.120 | 3.47E-03 |
| 78-87-5 | 1,2-Dichloropropane (propylene dichloride) | 112.99 | 0.023 | 7.59E-04 |
| 107-13-1 | Acrylonitrile (3) | 53.06 | 0.036 | 5.58E-04 |
| 71-43-2 | Benzene (4) | 78.11 | 0.972 | 2.22E-02 |
| 75-15-0 | Carbon disulfide | 76.13 | 0.320 | 7.12E-03 |
| 56-23-5 | Carbon tetrachloride (3) | 153.84 | 0.007 | 3.15E-04 |
| 463-58-1 | Carbonyl sulfide | 60.07 | 0.183 | 3.21E-03 |
| 108-90-7 | Chlorobenzene | 112.56 | 0.227 | 7.46E-03 |
| 75-00-3 | Chloroethane (ethyl chloride) | 64.52 | 0.239 | 4.50E-03 |
| 67-66-3 | Chloroform | 119.39 | 0.021 | 7.32E-04 |
| 74-87-3 | Chloromethane (methyl chloride) | 50.49 | 0.249 | 3.67E-03 |
| 106-46-7 | Dichlorobenzene (1,4-Dichlorobenzene) | 147 | 1.607 | 6.90E-02 |
| 75-09-2 | Dichloromethane (Methylene Chloride) | 84.94 | 3.395 | 8.42E-02 |
| 100-41-4 | Ethylbenzene | 106.16 | 6.789 | 2.11E-01 |
| 106-93-4 | Ethylene dibromide (1,2-Dibromoethane) (3) | 187.88 | 0.046 | 2.52E-03 |
| 110-54-3 | Hexane | 86.18 | 2.324 | 5.85E-02 |
| 7439-97-6 | Mercury (total) | 200.61 | 2.92E-04 | 1.71E-05 |
| 78-93-3 | Methyl ethyl ketone | 72.11 | 10.557 | 2.22E-01 |
| 108-10-1 | Methyl isobutyl ketone | 100.16 | 0.75 | 2.19E-02 |
| 127-18-4 | Perchloroethylene (tetrachloroethylene) | 165.83 | 1.193 | 5.78E-02 |
| 108-88-3 | Toluene (4) | 92.13 | 25.405 | 6.84E-01 |
| 79-01-6 | Trichloroethylene (trichloroethene) | 131.40 | 0.681 | 2.61E-02 |
| 75-01-4 | Vinyl chloride | 62.5 | 1.077 | 1.97E-02 |
| 1330-20-7 | Xylenes | 106.16 | 16.582 | 5.14E-01 |
| | **Total HAPs** | | | 2.06E+00 |
| | | | | |
| | **Criteria Air Pollutants** | | | |
| | Volatile Organic Compounds (VOCs) as Hexane (5) | 86.18 | 376 | 9.47E+00 |
| | Total Non-Methane Organics (NMOCs) as Hexane (6) | 86.18 | 965 | 2.43E+01 |

**Notes:**

(1) List is from AP-42, Section 2.4; Values obtained from WIAC, 2001, except for value for mercury, which was obtained from Table 2.4-1 of AP-42.

(2) Actual emissions are based on LFG generation from the landfill for 2014 with no gas collection.

(3) The value shown is the minimum detection limit. These compounds were not detected in MSW-only sites monitored in WIAC study.

(4) Default concentrations for benzene and toluene are based on WIAC values for site with no co-disposal.

(5) For VOCs, 39% by weight of NMOC concentrations assumed per AP-42.

(6) NMOC concentration based on 2013 site-specific Tier 2 test results (965 ppmv as hexane)

(7) scfm based upon USEPA LandGEM estimate using region specific k=(0.020) and $L_0$=(100).

| **MODEL INPUT VARIABLES** | | |
|---|---|---|
| NMOC concentration in landfill gas 6 | 965 | ppmv as hexane |
| Methane Content of LFG adjusted to: | 50% | |
| Landfill Gas Generation Rate for 2014 7 | 4.280E+02 | scfm LFG generation in 2014, from LandGEM model) |

# TABLE 3
# FUGITIVE DUST EMISSIONS FROM ROADWAY (E2)
# PAVED ROAD EMISSIONS
# TEKOI LANDFILL

**Emission Source:** Paved Roadway PRD-1
**Length of Road:** 7,920 feet
**Round Trip Road Length =** 3.00 miles

**Calculation of Average Vehicle Miles Traveled (VMT)**

| Type of Vehicle | Average Number of Vehicles/Day | Number of Trips Per day | Average VMT (per day) Actual | Operational Days/yr[1] | (per year) Actual |
|---|---|---|---|---|---|
| **Transfer Trucks** | | | | | |
| Transfer Trucks and Trailers | 8 | 2.8 | 67.2 | 260 | 17,472 |
| **Other Trucks** | | | | | |
| Diesel Fuel Truck[2] | 0.04 | 1.0 | 0.12 | 260 | 31 |
| Service Truck | 0.20 | 1.0 | 0.60 | 260 | 156 |
| 2007 Dodge Dakota | 1.00 | 0.5 | 1.50 | 260 | 390 |
| 2008 F150 | 1.00 | 2.0 | 6.00 | 260 | 1,560 |
| **Private Vehicles** | | | | | |
| Private (Employee Vehicles) | 2 | 1.0 | 6.0 | 260 | 1,560 |
| **TOTALS** | **12** | **8.3** | **81.4** | | **21,169** |

[1] 260 days/yr reflects 5 day work week
[2] Assumes approximately 16 fuel deliveries per year.

| Vehicle Type | Average Weight (tons) | Average Number of Vehicles/Day | Weight times # of vehicles (tons) |
|---|---|---|---|
| Transfer Trucks and Trailers | 39.5 | 8 | 316 |
| Diesel Fuel Truck | 19.2 | 0.04 | 1 |
| Service Truck | 16.5 | 0.20 | 3 |
| 2008 F150 | 2.5 | 1.00 | 3 |
| 2007 Dodge Dakota | 2.5 | 1.00 | 3 |
| Private (Employee Vehicles) | 2.5 | 2 | 5 |
| **TOTAL** | | **12.2** | **330** |
| | | **Average Vehicle Weight (tons)** | **26.97** |

**Methodologies:**
AP-42, Section 13.2.1-3, Equation (2), for Paved Roads.

$$E = [k(sL)^{0.91} * (W)^{1.02}] * (1-P/4N)$$

**E** = Emission factor in pounds per vehicle mile traveled (lb/VMT)
**k** = Particle size multiplier (lb/VMT)
**sL** = Road surface silt loading factor ($g/m^2$)
**W** = Average Vehicle weight in tons
**P** = Number of days with rain > 0.01 inches
**N** = Averaging period

**Fugitive Dust Control Measures:** Control Efficiency

**Methodologies:**

EPA: Fugitive Dust Background Document and Technical Information Document for BACM, Sept. 1992, Table 3-1 Measure Efficiency Values for Paved Road Controls

| **Fugitive Dust Control Measures:** | Control Efficiency |
|---|---|
| Watering Roads as needed: None | 0% |
| Street Sweeping as needed: None | 0% |

# TABLE 3
# FUGITIVE DUST EMISSIONS FROM ROADWAY (E2)
# PAVED ROAD EMISSIONS
# TEKOI LANDFILL

Cumulative Total Control: 0%

| **Variables:** | **k factor[1]** | **Silt loading[2] (sL)** | **W** | **P[3]** | **N** (Long Term) |
|---|---|---|---|---|---|
| **Pollutant** | lb/VMT | $g/m^2$ | Tons | days | days |
| **PM-10** | 0.0022 | 7.4 | 26.97 | 90 | 365 |

[1] From AP-42, Table 13.2-1.1
[2] From AP-42, Table 13.2.1-4
[3] From AP-42, Figure 13.2.1-2

**Summary of PM10 Emissions From Roadway Segment PRD-1**

| | Emission Factor | Actual Emissions | |
|---|---|---|---|
| Pollutant | lb/VMT (daily) | lbs/day | tons/yr |
| PM-10 | **0.3675** | **29.92** | **3.89** |

# TABLE 4
# CONTROLLED FUGITIVE DUST EMISSIONS FROM ROADWAY (E2)
# UNPAVED ROAD EMISSIONS
# TEKOI LANDFILL

**Emission Source:** Unpaved Roadway UPR-1 (Main Haul Road)
**Length of Road:** feet 2,600
Round Trip Road Length = 0.98 miles

**Calculation of Average Vehicle Miles Traveled (VMT)**

| Type of Vehicle | Average Number of Vehicles/Day | Number of Trips Per day | Average VMT (per day) Actual | Operational Days/yr[1] | (per year) Actual |
|---|---|---|---|---|---|
| **Dozers** | | | | | |
| CAT D5 Dozer[2] | 1 | 1 | 0.05 | 260 | 13 |
| CAT D8R1[2] | 1 | 1 | 0.05 | 260 | 13 |
| **Loaders** | | | | | |
| CAT 950G [3] | 2 | 3 | 1.5 | 260 | 384 |
| Komatsu 250 Loader [3] | 1 | 5 | 1.2 | 260 | 320 |
| **Water Trucks** | | | | | |
| Diesel Water Truck [4] | 1 | 2 | 2.0 | 260 | 0 |
| **Compactor** | | | | | |
| 826H CAT Compactor[8] | 0 | 0 | 0.0 | 260 | 0 |
| **Transfer Trucks** | | | | | |
| Off-Site Transfer Trucks and Trailers[6] | 8 | 24 | 32.1 | 260 | 8,358 |
| **Other Trucks** | | | | | |
| Site Fuel Truck[5] | 1 | 2 | 0.4 | 260 | 102 |
| Yard Truck AM Generator[5] | 1 | 24 | 4.7 | 260 | 1,229 |
| Yard Truck (Mack MR6885 - spare) | 1 | 0 | 0.0 | 260 | 0 |
| Ford F150 (2008)[5] | 1 | 3 | 0.6 | 260 | 154 |
| Service Truck[7] | 1 | 2 | 0.8 | 260 | 215 |
| **Private Vehicles** | | | | | |
| Private (Employee Vehicles)[6] | 1 | 2 | 0.3 | 260 | 87 |
| **TOTALS** | **20** | **69** | **43.8** | | **10,875** |

[1] 260 days/yr reflects 5 day work week

[2] Stays in active fill area, except to do road work periodically. Average VMT has been reduced by 95% because equipment travels only 5% of main haul road length.

[3] Average VMT has been reduced by 75% since equipment only travels 25% of main haul road length

[4] Due to water activates, the water truck is assumed to create no dust emissions

[5] Average VMT has been reduced by 80% since truck only travels 20% of main haul road length

[6] Average VMT has been reduced by 83% since truck only travels 17% of main haul road length

# TABLE 4
# CONTROLLED FUGITIVE DUST EMISSIONS FROM ROADWAY (E2)
# UNPAVED ROAD EMISSIONS
# TEKOI LANDFILL

[7] Average VMT has been reduced by 58% since truck only travels 42% of main haul road length

[8]Remains in trash area.

| Vehicle Type | Average Weight (tons) | Average Number of Vehicles/Day | Weight times # of vehicles |
|---|---|---|---|
| CAT D5 Dozer | 14.4 | 1 | 14 |
| CAT D8R1 | 42.0 | 1 | 42 |
| CAT 950G | 8.7 | 2 | 17 |
| Komatsu 250 Loader | 8.0 | 1 | 8 |
| Diesel Water Truck | 12.0 | 1 | 12 |
| CAT 826H Compactor | 41.0 | 1 | 41 |
| Off-Site Transfer Trucks and Trailers | 39.5 | 8 | 316 |
| Site Fuel Truck | 14.0 | 1 | 14 |
| Yard Truck AM Generator | 4.4 | 1 | 4 |
| Yard Truck (Mack MR6885 - spare) | 4.4 | 0 | 0 |
| Ford F150 (2008) | 3.2 | 1 | 3 |
| Service Truck | 4.4 | 1 | 4 |
| Private (Employee Vehicles) | 2.5 | 1 | 3 |
| **TOTAL** | | **18** | **462** |
| | | **Average Vehicle Weight (tons)** | **25.69** |

**Methodologies:**

AP-42, Section 13.2.2.2, Equation (1a), for Unpaved Roads at Industrial Sites.

$$E = k(s/12)^a * (W/3)^b * [(365-P)/365]$$

**E** = Emission factor in pounds per vehicle mile traveled (lb/VMT)
**k** = Particle size multiplier (lb/VMT)
**a** = Empirical Constant from Table 13.2.2-2
**b** = Empirical Constant from Table 13.2.2-2
**s** = Surface material silt content (%)
**W** = Average Vehicle weight in tons
**P** = Number of days with rain > 0.01 inches

| **Fugitive Dust Control Measures:** | Control Efficiency | Source: |
|---|---|---|
| Watering Roads as needed: | 80% | EPA: *AP-42, Section 13.2.2.3* |
| Chemical Dust Suppressants: None | 0% | |
| Cumulative Total Control: | 80% | |

| **Variables:** | **k factor[1]** | **a** | **b** | **Surface Silt Content[2] (%)** | **W** | **P[3]** |
|---|---|---|---|---|---|---|
| **Pollutant** | lb/VMT | | | (%) | Tons | days |
| **PM-10** | 1.5 | 0.9 | 0.45 | 6.4 | 25.69 | 90 |
| **PM-2.5** | 0.15 | 0.9 | 0.45 | 6.4 | 25.69 | 90 |
| **TSP** | 4.9 | 0.7 | 0.45 | 6.4 | 25.69 | 90 |

[1] From AP-42, Section 13.2.1.3
[2] AP-42 (Table 13.2.2-1) mean silt content for municipal solid waste landfills
[3] From AP-42, Figure 13.2.1-2

**Summary of PM10 Emissions From Roadway Segment UPR-2**

| Pollutant | Emission Factor lb/VMT (daily) | Actual Emissions lbs/day | Actual Emissions tons/yr |
|---|---|---|---|
| **PM-10** | **1.6870** | **14.78** | **1.83** |

# TABLE 5
# FUGITIVE DUST FROM MATERIAL HANDLING (E2)
# TEKOI LANDFILL

According to AP-42, Section 13.2.4, Aggregate Handling and Storage Piles:

AP-42, Section 13.2.4.3 Predictive Emission Factor Equations (11/06)

Total dust emissions from aggregate storage piles result from several distinct source activities within the storage cycle:

1. Loading of aggregate onto storage piles (batch or continous drop operations).
2. Equipment traffic in storage area.
3. Wind erosion of pile surfaces and ground areas around piles.
4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous).

Either adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front-end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

The quantity of particulate matter emissions generated by either type of drop operation may be estimated using equation 1.

$$E = k(0.0032)\,[(G/5)^{1.3}]/[(H/2)^{1.4}]$$

E = Emission Factor, lb/ton
k = particle size multiplier (dimensionless) (Section 13.2.4.3)
G = mean wind speed, miles per hour (mph)
H = Material moisture content (%) (Table 13.2.4-1)

**Particle Size Multiplier, k**

| Particle Size | k |
|---|---|
| PM-10 | 0.35 |
| PM-2.5 | 0.053 |
| PM-30 (TSP) | 0.74 |

**Mean Wind Speed, U**

Based on Meteorological Data from Salt Lake City International Airport

| | Wind Speed (mph) |
|---|---|
| **Average** | **5.00** |

**Material Moisture Content, %**

For municipal Solid Waste Landfills (cover material)
M = 12% (mean)

***Emission Factor Calculation***

For PM-10: $E = [(0.35) * (0.0032) * [(8.60/5)^{1.3} / (0.12/2)^{1.4}]$

$E =$ 0.0575 lb/ton

For PM-2.5 $E = [(0.053) * (0.0032) * [(8.60/5)^{1.3} / (0.12/2)^{1.4}]$

$E =$ 0.0087 lb/ton

For PM-30 (TSP): $E = [(0.74) * (0.0032) * [(8.60/5)^{1.3} / (0.12/2)^{1.4}]$

$E =$ 0.1216 lb/ton

## Fugitive Dust from Material Handling

| | Actual | |
|---|---|---|
| Estimated Density of Soil Cover: | 2,400 | $lbs/yd^3$ |
| Estimated Density of ADC: | 1,080 | lb/yd3 |
| Percent of soil/ADC to refuse: | 35% | |
| Current Average Disposal Rate: | 705 | tpd |
| Estimated Density of Refuse: | 1,465 | $lb/yd^3$ |
| Volume of Refuse Disposed: | 962 | $yd^3/day$ |
| | | |
| Amount of Cover Used = | 337 | $yd^3$ of soil/ADC cover used |
| | 100 | tons/day ADC cover used |
| | 284 | tons/day soil cover used |
| | 73,932 | ton/yr soil cover used |
| | 20 | transfers per day assuming each scraper is 17 cubic yards |

| | Actual | |
|---|---|---|
| **PM-10 Emissions =** | **5,102.90** | **lb/yr** |
| | **16.36** | **lb/day** |
| | **2.55** | **ton/yr** |

# Summary Report

**Landfill Name or Identifier:** Tekoi Landfill, Utah

**Date:** Monday, March 23, 2015

**Description/Comments:**

**About LandGEM:**

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} k L_o \left( \frac{M_i}{10} \right) e^{-k t_{ij}}$$

Where,

$Q_{CH4}$ = annual methane generation in the year of the calculation *($m^3$/year)*
i = 1-year time increment
n = (year of the calculation) - (initial year of waste acceptance)
j = 0.1-year time increment
k = methane generation rate *($year^{-1}$)*
$L_o$ = potential methane generation capacity *($m^3$/Mg)*

$M_i$ = mass of waste accepted in the $i^{th}$ year *(Mg)*
$t_{ij}$ = age of the $j^{th}$ section of waste mass $M_i$ accepted in the $i^{th}$ year (*decimal years*, e.g., 3.2 years)

LandGEM is based on a first-order decomposition rate equation for quantifying emissions from the decomposition of landfilled waste in municipal solid waste (MSW) landfills. The software provides a relatively simple approach to estimating landfill gas emissions. Model defaults are based on empirical data from U.S. landfills. Field test data can also be used in place of model defaults when available. Further guidance on EPA test methods, Clean Air Act (CAA) regulations, and other guidance regarding landfill gas emissions and control technology requirements can be found at http://www.epa.gov/ttnatw01/landfill/landflpg.html.

LandGEM is considered a screening tool — the better the input data, the better the estimates. Often, there are limitations with the available data regarding waste quantity and composition, variation in design and operating practices over time, and changes occurring over time that impact the emissions potential. Changes to landfill operation, such as operating under wet conditions through leachate recirculation or other liquid additions, will result in generating more gas at a faster rate. Defaults for estimating emissions for this type of operation are being developed to include in LandGEM along with defaults for convential landfills (no leachate or liquid additions) for developing emission inventories and determining CAA applicability. Refer to the Web site identified above for future updates.

## Input Review

LANDFILL CHARACTERISTICS

| | | |
|---|---|---|
| Landfill Open Year | **2005** | |
| Landfill Closure Year (with 80-year limit) | **2084** | |
| *Actual Closure Year (without limit)* | ***2084*** | |
| Have Model Calculate Closure Year? | **No** | |
| Waste Design Capacity | | *short tons* |

MODEL PARAMETERS

| | | |
|---|---|---|
| Methane Generation Rate, k | **0.020** | *$year^{-1}$* |
| Potential Methane Generation Capacity, $L_o$ | **100** | *$m^3/Mg$* |
| NMOC Concentration | **965** | *ppmv as hexane* |
| Methane Content | **50** | *% by volume* |

GASES / POLLUTANTS SELECTED

| | |
|---|---|
| Gas / Pollutant #1: | **Total landfill gas** |
| Gas / Pollutant #2: | **Methane** |
| Gas / Pollutant #3: | **Carbon dioxide** |
| Gas / Pollutant #4: | **NMOC** |

WASTE ACCEPTANCE RATES

| Year | Waste Accepted | | Waste-In-Place | |
|---|---|---|---|---|
| | *(Mg/year)* | *(short tons/year)* | *(Mg)* | *(short tons)* |
| 2005 | 140,242 | 154,266 | 0 | 0 |
| 2006 | 268,131 | 294,944 | 140,242 | 154,266 |
| 2007 | 264,525 | 290,978 | 408,373 | 449,210 |
| 2008 | 192,975 | 212,273 | 672,898 | 740,188 |
| 2009 | 185,518 | 204,070 | 865,874 | 952,461 |
| 2010 | 170,159 | 187,175 | 1,051,392 | 1,156,531 |
| 2011 | 183,426 | 201,769 | 1,221,551 | 1,343,706 |
| 2012 | 172,854 | 190,140 | 1,404,977 | 1,545,475 |
| 2013 | 169,091 | 186,000 | 1,577,832 | 1,735,615 |
| 2014 | 196,194 | 215,814 | 1,746,922 | 1,921,615 |
| 2015 | 165,726 | 182,299 | 1,943,117 | 2,137,428 |
| 2016 | 164,069 | 180,476 | 2,108,843 | 2,319,727 |
| 2017 | 162,428 | 178,671 | 2,272,912 | 2,500,203 |
| 2018 | 159,195 | 175,115 | 2,435,340 | 2,678,874 |
| 2019 | 159,195 | 175,115 | 2,594,536 | 2,853,989 |
| 2020 | 159,195 | 175,115 | 2,753,731 | 3,029,104 |
| 2021 | 159,195 | 175,115 | 2,912,927 | 3,204,219 |
| 2022 | 159,195 | 175,115 | 3,072,122 | 3,379,334 |
| 2023 | 159,195 | 175,115 | 3,231,318 | 3,554,449 |
| 2024 | 159,195 | 175,115 | 3,390,513 | 3,729,564 |
| 2025 | 159,195 | 175,115 | 3,549,708 | 3,904,679 |
| 2026 | 159,195 | 175,115 | 3,708,904 | 4,079,794 |
| 2027 | 159,195 | 175,115 | 3,868,099 | 4,254,909 |
| 2028 | 159,195 | 175,115 | 4,027,295 | 4,430,024 |
| 2029 | 159,195 | 175,115 | 4,186,490 | 4,605,139 |
| 2030 | 159,195 | 175,115 | 4,345,686 | 4,780,254 |
| 2031 | 159,195 | 175,115 | 4,504,881 | 4,955,369 |
| 2032 | 159,195 | 175,115 | 4,664,077 | 5,130,484 |
| 2033 | 159,195 | 175,115 | 4,823,272 | 5,305,599 |
| 2034 | 159,195 | 175,115 | 4,982,468 | 5,480,714 |
| 2035 | 159,195 | 175,115 | 5,141,663 | 5,655,829 |
| 2036 | 159,195 | 175,115 | 5,300,858 | 5,830,944 |
| 2037 | 159,195 | 175,115 | 5,460,054 | 6,006,059 |
| 2038 | 159,195 | 175,115 | 5,619,249 | 6,181,174 |
| 2039 | 159,195 | 175,115 | 5,778,445 | 6,356,289 |
| 2040 | 159,195 | 175,115 | 5,937,640 | 6,531,404 |
| 2041 | 159,195 | 175,115 | 6,096,836 | 6,706,519 |
| 2042 | 159,195 | 175,115 | 6,256,031 | 6,881,634 |
| 2043 | 159,195 | 175,115 | 6,415,227 | 7,056,749 |
| 2044 | 159,195 | 175,115 | 6,574,422 | 7,231,864 |

WASTE ACCEPTANCE RATES (Continued)

| Year | Waste Accepted | | Waste-In-Place | |
|---|---|---|---|---|
| | *(Mg/year)* | *(short tons/year)* | *(Mg)* | *(short tons)* |
| 2045 | 159,195 | 175,115 | 6,733,618 | 7,406,979 |
| 2046 | 159,195 | 175,115 | 6,892,813 | 7,582,094 |
| 2047 | 159,195 | 175,115 | 7,052,008 | 7,757,209 |
| 2048 | 159,195 | 175,115 | 7,211,204 | 7,932,324 |
| 2049 | 159,195 | 175,115 | 7,370,399 | 8,107,439 |
| 2050 | 159,195 | 175,115 | 7,529,595 | 8,282,554 |
| 2051 | 159,195 | 175,115 | 7,688,790 | 8,457,669 |
| 2052 | 159,195 | 175,115 | 7,847,986 | 8,632,784 |
| 2053 | 159,195 | 175,115 | 8,007,181 | 8,807,899 |
| 2054 | 152,167 | 167,384 | 8,166,377 | 8,983,014 |
| 2055 | 239,455 | 263,400 | 8,318,544 | 9,150,398 |
| 2056 | 246,638 | 271,302 | 8,557,998 | 9,413,798 |
| 2057 | 254,037 | 279,441 | 8,804,637 | 9,685,100 |
| 2058 | 261,658 | 287,824 | 9,058,674 | 9,964,541 |
| 2059 | 269,508 | 296,459 | 9,320,332 | 10,252,366 |
| 2060 | 277,593 | 305,353 | 9,589,841 | 10,548,825 |
| 2061 | 285,921 | 314,513 | 9,867,434 | 10,854,177 |
| 2062 | 294,499 | 323,949 | 10,153,355 | 11,168,691 |
| 2063 | 303,334 | 333,667 | 10,447,854 | 11,492,640 |
| 2064 | 312,434 | 343,677 | 10,751,188 | 11,826,307 |
| 2065 | 321,807 | 353,988 | 11,063,622 | 12,169,984 |
| 2066 | 331,461 | 364,607 | 11,385,429 | 12,523,972 |
| 2067 | 341,405 | 375,545 | 11,716,890 | 12,888,579 |
| 2068 | 351,647 | 386,812 | 12,058,295 | 13,264,124 |
| 2069 | 362,196 | 398,416 | 12,409,942 | 13,650,936 |
| 2070 | 373,062 | 410,369 | 12,772,138 | 14,049,352 |
| 2071 | 384,254 | 422,680 | 13,145,201 | 14,459,721 |
| 2072 | 395,782 | 435,360 | 13,529,455 | 14,882,401 |
| 2073 | 407,655 | 448,421 | 13,925,237 | 15,317,761 |
| 2074 | 419,885 | 461,873 | 14,332,892 | 15,766,181 |
| 2075 | 432,482 | 475,730 | 14,752,777 | 16,228,055 |
| 2076 | 445,456 | 490,002 | 15,185,259 | 16,703,785 |
| 2077 | 458,820 | 504,702 | 15,630,715 | 17,193,786 |
| 2078 | 472,584 | 519,843 | 16,089,534 | 17,698,488 |
| 2079 | 486,762 | 535,438 | 16,562,119 | 18,218,331 |
| 2080 | 501,365 | 551,501 | 17,048,880 | 18,753,769 |
| 2081 | 516,406 | 568,046 | 17,550,245 | 19,305,270 |
| 2082 | 531,898 | 585,088 | 18,066,651 | 19,873,316 |
| 2083 | 547,855 | 602,640 | 18,598,548 | 20,458,403 |
| 2084 | 564,290 | 620,719 | 19,146,403 | 21,061,043 |

## Pollutant Parameters

| | | *Gas / Pollutant Default Parameters:* | | *User-specified Pollutant Parameters:* | |
|---|---|---|---|---|---|
| | Compound | Concentration (*ppmv*) | Molecular Weight | Concentration (*ppmv*) | Molecular Weight |
| **Gases** | Total landfill gas | | 0.00 | | |
| | Methane | | 16.04 | | |
| | Carbon dioxide | | 44.01 | | |
| | NMOC | 4,000 | 86.18 | | |
| **Pollutants** | 1,1,1-Trichloroethane (methyl chloroform) - HAP | 0.48 | 133.41 | | |
| | 1,1,2,2-Tetrachloroethane - HAP/VOC | 1.1 | 167.85 | | |
| | 1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC | 2.4 | 98.97 | | |
| | 1,1-Dichloroethene (vinylidene chloride) - HAP/VOC | 0.20 | 96.94 | | |
| | 1,2-Dichloroethane (ethylene dichloride) - HAP/VOC | 0.41 | 98.96 | | |
| | 1,2-Dichloropropane (propylene dichloride) - HAP/VOC | 0.18 | 112.99 | | |
| | 2-Propanol (isopropyl alcohol) - VOC | 50 | 60.11 | | |
| | Acetone | 7.0 | 58.08 | | |
| | Acrylonitrile - HAP/VOC | 6.3 | 53.06 | | |
| | Benzene - No or Unknown Co-disposal - HAP/VOC | 1.9 | 78.11 | | |
| | Benzene - Co-disposal - HAP/VOC | 11 | 78.11 | | |
| | Bromodichloromethane - VOC | 3.1 | 163.83 | | |
| | Butane - VOC | 5.0 | 58.12 | | |
| | Carbon disulfide - HAP/VOC | 0.58 | 76.13 | | |
| | Carbon monoxide | 140 | 28.01 | | |
| | Carbon tetrachloride - HAP/VOC | 4.0E-03 | 153.84 | | |
| | Carbonyl sulfide - HAP/VOC | 0.49 | 60.07 | | |
| | Chlorobenzene - HAP/VOC | 0.25 | 112.56 | | |
| | Chlorodifluoromethane | 1.3 | 86.47 | | |
| | Chloroethane (ethyl chloride) - HAP/VOC | 1.3 | 64.52 | | |
| | Chloroform - HAP/VOC | 0.03 | 119.39 | | |
| | Chloromethane - VOC | 1.2 | 50.49 | | |
| | Dichlorobenzene - (HAP for para isomer/VOC) | 0.21 | 147 | | |
| | Dichlorodifluoromethane | 16 | 120.91 | | |
| | Dichlorofluoromethane - VOC | 2.6 | 102.92 | | |
| | Dichloromethane (methylene chloride) - HAP | 14 | 84.94 | | |
| | Dimethyl sulfide (methyl sulfide) - VOC | 7.8 | 62.13 | | |
| | Ethane | 890 | 30.07 | | |
| | Ethanol - VOC | 27 | 46.08 | | |

## Pollutant Parameters (Continued)

| | Compound | Gas / Pollutant Default Parameters: Concentration (*ppmv*) | Molecular Weight | User-specified Pollutant Parameters: Concentration (*ppmv*) | Molecular Weight |
|---|---|---|---|---|---|
| Pollutants | Ethyl mercaptan (ethanethiol) - VOC | 2.3 | 62.13 | | |
| | Ethylbenzene - HAP/VOC | 4.6 | 106.16 | | |
| | Ethylene dibromide - HAP/VOC | 1.0E-03 | 187.88 | | |
| | Fluorotrichloromethane - VOC | 0.76 | 137.38 | | |
| | Hexane - HAP/VOC | 6.6 | 86.18 | | |
| | Hydrogen sulfide | 36 | 34.08 | | |
| | Mercury (total) - HAP | 2.9E-04 | 200.61 | | |
| | Methyl ethyl ketone - HAP/VOC | 7.1 | 72.11 | | |
| | Methyl isobutyl ketone - HAP/VOC | 1.9 | 100.16 | | |
| | Methyl mercaptan - VOC | 2.5 | 48.11 | | |
| | Pentane - VOC | 3.3 | 72.15 | | |
| | Perchloroethylene (tetrachloroethylene) - HAP | 3.7 | 165.83 | | |
| | Propane - VOC | 11 | 44.09 | | |
| | t-1,2-Dichloroethene - VOC | 2.8 | 96.94 | | |
| | Toluene - No or Unknown Co-disposal - HAP/VOC | 39 | 92.13 | | |
| | Toluene - Co-disposal - HAP/VOC | 170 | 92.13 | | |
| | Trichloroethylene (trichloroethene) - HAP/VOC | 2.8 | 131.40 | | |
| | Vinyl chloride - HAP/VOC | 7.3 | 62.50 | | |
| | Xylenes - HAP/VOC | 12 | 106.16 | | |
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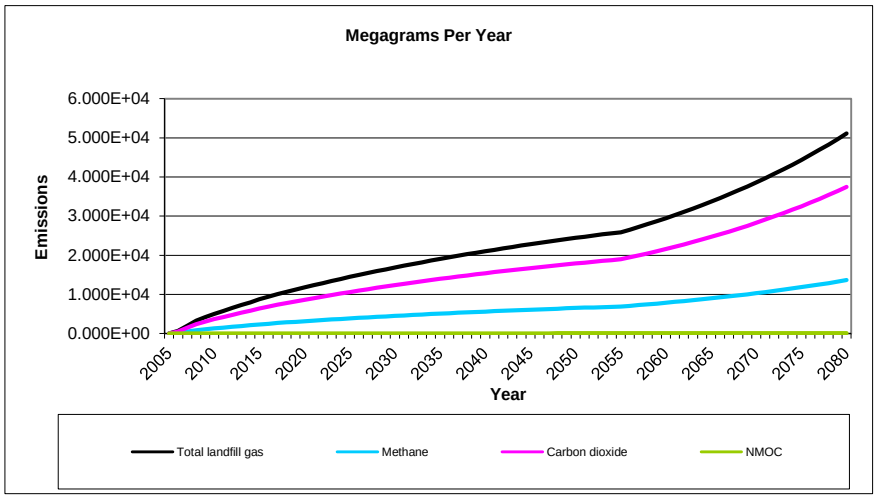
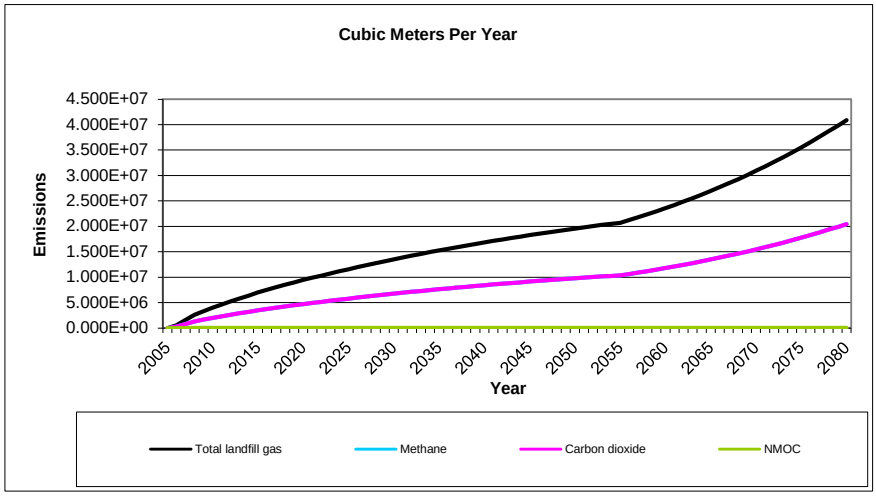
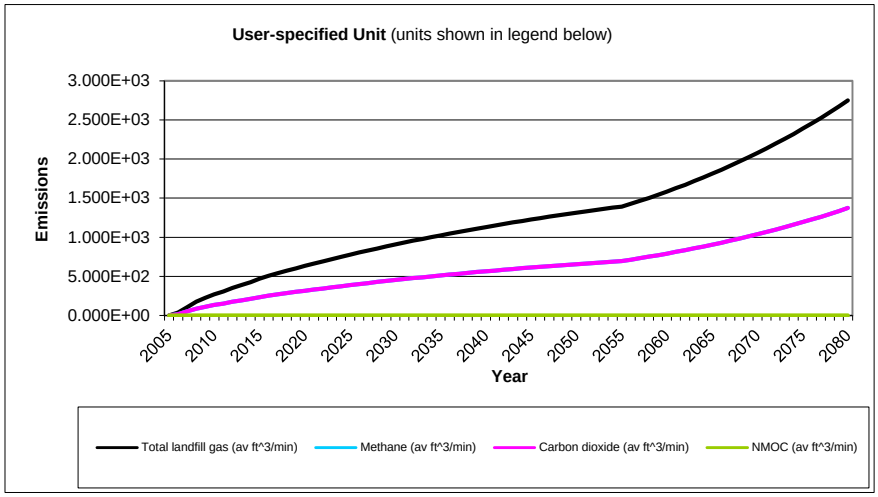
## Graphs


Megagrams Per Year
Emissions
6.000E+04
5.000E+04
4.000E+04
3.000E+04
2.000E+04
1.000E+04
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


Cubic Meters Per Year
Emissions
4.500E+07
4.000E+07
3.500E+07
3.000E+07
2.500E+07
2.000E+07
1.500E+07
1.000E+07
5.000E+06
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas
Methane
Carbon dioxide
NMOC


User-specified Unit (units shown in legend below)
Emissions
3.000E+03
2.500E+03
2.000E+03
1.500E+03
1.000E+03
5.000E+02
0.000E+00
2005 2010 2015 2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080
Year
Total landfill gas (av ft^3/min)
Methane (av ft^3/min)
Carbon dioxide (av ft^3/min)
NMOC (av ft^3/min)

## Results

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 6.943E+02 | 5.560E+05 | 3.735E+01 | 1.855E+02 | 2.780E+05 | 1.868E+01 |
| 2007 | 2.008E+03 | 1.608E+06 | 1.080E+02 | 5.363E+02 | 8.039E+05 | 5.402E+01 |
| 2008 | 3.278E+03 | 2.625E+06 | 1.764E+02 | 8.755E+02 | 1.312E+06 | 8.818E+01 |
| 2009 | 4.168E+03 | 3.338E+06 | 2.243E+02 | 1.113E+03 | 1.669E+06 | 1.121E+02 |
| 2010 | 5.004E+03 | 4.007E+06 | 2.692E+02 | 1.337E+03 | 2.004E+06 | 1.346E+02 |
| 2011 | 5.747E+03 | 4.602E+06 | 3.092E+02 | 1.535E+03 | 2.301E+06 | 1.546E+02 |
| 2012 | 6.542E+03 | 5.238E+06 | 3.520E+02 | 1.747E+03 | 2.619E+06 | 1.760E+02 |
| 2013 | 7.268E+03 | 5.820E+06 | 3.910E+02 | 1.941E+03 | 2.910E+06 | 1.955E+02 |
| 2014 | 7.961E+03 | 6.375E+06 | 4.283E+02 | 2.126E+03 | 3.187E+06 | 2.142E+02 |
| 2015 | 8.775E+03 | 7.026E+06 | 4.721E+02 | 2.344E+03 | 3.513E+06 | 2.361E+02 |
| 2016 | 9.421E+03 | 7.544E+06 | 5.069E+02 | 2.517E+03 | 3.772E+06 | 2.534E+02 |
| 2017 | 1.005E+04 | 8.045E+06 | 5.406E+02 | 2.684E+03 | 4.023E+06 | 2.703E+02 |
| 2018 | 1.065E+04 | 8.530E+06 | 5.731E+02 | 2.845E+03 | 4.265E+06 | 2.866E+02 |
| 2019 | 1.123E+04 | 8.992E+06 | 6.042E+02 | 3.000E+03 | 4.496E+06 | 3.021E+02 |
| 2020 | 1.180E+04 | 9.445E+06 | 6.346E+02 | 3.151E+03 | 4.723E+06 | 3.173E+02 |
| 2021 | 1.235E+04 | 9.889E+06 | 6.644E+02 | 3.299E+03 | 4.945E+06 | 3.322E+02 |
| 2022 | 1.289E+04 | 1.032E+07 | 6.937E+02 | 3.444E+03 | 5.162E+06 | 3.468E+02 |
| 2023 | 1.343E+04 | 1.075E+07 | 7.224E+02 | 3.586E+03 | 5.376E+06 | 3.612E+02 |
| 2024 | 1.395E+04 | 1.117E+07 | 7.505E+02 | 3.726E+03 | 5.585E+06 | 3.752E+02 |
| 2025 | 1.446E+04 | 1.158E+07 | 7.780E+02 | 3.863E+03 | 5.790E+06 | 3.890E+02 |
| 2026 | 1.496E+04 | 1.198E+07 | 8.050E+02 | 3.997E+03 | 5.990E+06 | 4.025E+02 |
| 2027 | 1.545E+04 | 1.237E+07 | 8.315E+02 | 4.128E+03 | 6.187E+06 | 4.157E+02 |
| 2028 | 1.594E+04 | 1.276E+07 | 8.574E+02 | 4.257E+03 | 6.380E+06 | 4.287E+02 |
| 2029 | 1.641E+04 | 1.314E+07 | 8.828E+02 | 4.383E+03 | 6.570E+06 | 4.414E+02 |
| 2030 | 1.687E+04 | 1.351E+07 | 9.077E+02 | 4.507E+03 | 6.755E+06 | 4.539E+02 |
| 2031 | 1.733E+04 | 1.387E+07 | 9.322E+02 | 4.628E+03 | 6.937E+06 | 4.661E+02 |
| 2032 | 1.777E+04 | 1.423E+07 | 9.561E+02 | 4.747E+03 | 7.115E+06 | 4.781E+02 |
| 2033 | 1.821E+04 | 1.458E+07 | 9.796E+02 | 4.863E+03 | 7.290E+06 | 4.898E+02 |
| 2034 | 1.863E+04 | 1.492E+07 | 1.003E+03 | 4.978E+03 | 7.461E+06 | 5.013E+02 |
| 2035 | 1.905E+04 | 1.526E+07 | 1.025E+03 | 5.089E+03 | 7.629E+06 | 5.126E+02 |
| 2036 | 1.946E+04 | 1.559E+07 | 1.047E+03 | 5.199E+03 | 7.793E+06 | 5.236E+02 |
| 2037 | 1.987E+04 | 1.591E+07 | 1.069E+03 | 5.307E+03 | 7.954E+06 | 5.345E+02 |
| 2038 | 2.026E+04 | 1.622E+07 | 1.090E+03 | 5.412E+03 | 8.112E+06 | 5.451E+02 |
| 2039 | 2.065E+04 | 1.653E+07 | 1.111E+03 | 5.516E+03 | 8.267E+06 | 5.555E+02 |
| 2040 | 2.103E+04 | 1.684E+07 | 1.131E+03 | 5.617E+03 | 8.419E+06 | 5.657E+02 |
| 2041 | 2.140E+04 | 1.714E+07 | 1.151E+03 | 5.716E+03 | 8.568E+06 | 5.757E+02 |
| 2042 | 2.176E+04 | 1.743E+07 | 1.171E+03 | 5.813E+03 | 8.714E+06 | 5.855E+02 |
| 2043 | 2.212E+04 | 1.771E+07 | 1.190E+03 | 5.909E+03 | 8.857E+06 | 5.951E+02 |
| 2044 | 2.247E+04 | 1.799E+07 | 1.209E+03 | 6.002E+03 | 8.997E+06 | 6.045E+02 |
| 2045 | 2.281E+04 | 1.827E+07 | 1.227E+03 | 6.094E+03 | 9.134E+06 | 6.137E+02 |
| 2046 | 2.315E+04 | 1.854E+07 | 1.246E+03 | 6.184E+03 | 9.269E+06 | 6.228E+02 |
| 2047 | 2.348E+04 | 1.880E+07 | 1.263E+03 | 6.272E+03 | 9.401E+06 | 6.317E+02 |
| 2048 | 2.380E+04 | 1.906E+07 | 1.281E+03 | 6.358E+03 | 9.531E+06 | 6.404E+02 |
| 2049 | 2.412E+04 | 1.931E+07 | 1.298E+03 | 6.443E+03 | 9.657E+06 | 6.489E+02 |
| 2050 | 2.443E+04 | 1.956E+07 | 1.314E+03 | 6.526E+03 | 9.782E+06 | 6.572E+02 |
| 2051 | 2.474E+04 | 1.981E+07 | 1.331E+03 | 6.607E+03 | 9.904E+06 | 6.654E+02 |
| 2052 | 2.503E+04 | 2.005E+07 | 1.347E+03 | 6.687E+03 | 1.002E+07 | 6.734E+02 |
| 2053 | 2.533E+04 | 2.028E+07 | 1.363E+03 | 6.765E+03 | 1.014E+07 | 6.813E+02 |
| 2054 | 2.561E+04 | 2.051E+07 | 1.378E+03 | 6.841E+03 | 1.025E+07 | 6.890E+02 |

## Results (Continued)

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2055 | 2.586E+04 | 2.071E+07 | 1.391E+03 | 6.907E+03 | 1.035E+07 | 6.956E+02 |
| 2056 | 2.653E+04 | 2.125E+07 | 1.428E+03 | 7.087E+03 | 1.062E+07 | 7.138E+02 |
| 2057 | 2.723E+04 | 2.180E+07 | 1.465E+03 | 7.273E+03 | 1.090E+07 | 7.325E+02 |
| 2058 | 2.795E+04 | 2.238E+07 | 1.504E+03 | 7.465E+03 | 1.119E+07 | 7.518E+02 |
| 2059 | 2.869E+04 | 2.297E+07 | 1.544E+03 | 7.663E+03 | 1.149E+07 | 7.718E+02 |
| 2060 | 2.945E+04 | 2.359E+07 | 1.585E+03 | 7.868E+03 | 1.179E+07 | 7.924E+02 |
| 2061 | 3.025E+04 | 2.422E+07 | 1.627E+03 | 8.079E+03 | 1.211E+07 | 8.136E+02 |
| 2062 | 3.106E+04 | 2.487E+07 | 1.671E+03 | 8.297E+03 | 1.244E+07 | 8.356E+02 |
| 2063 | 3.191E+04 | 2.555E+07 | 1.717E+03 | 8.522E+03 | 1.277E+07 | 8.583E+02 |
| 2064 | 3.278E+04 | 2.624E+07 | 1.763E+03 | 8.755E+03 | 1.312E+07 | 8.817E+02 |
| 2065 | 3.367E+04 | 2.696E+07 | 1.812E+03 | 8.994E+03 | 1.348E+07 | 9.058E+02 |
| 2066 | 3.460E+04 | 2.771E+07 | 1.862E+03 | 9.242E+03 | 1.385E+07 | 9.308E+02 |
| 2067 | 3.556E+04 | 2.847E+07 | 1.913E+03 | 9.497E+03 | 1.424E+07 | 9.565E+02 |
| 2068 | 3.654E+04 | 2.926E+07 | 1.966E+03 | 9.761E+03 | 1.463E+07 | 9.830E+02 |
| 2069 | 3.756E+04 | 3.008E+07 | 2.021E+03 | 1.003E+04 | 1.504E+07 | 1.010E+03 |
| 2070 | 3.861E+04 | 3.092E+07 | 2.077E+03 | 1.031E+04 | 1.546E+07 | 1.039E+03 |
| 2071 | 3.969E+04 | 3.178E+07 | 2.135E+03 | 1.060E+04 | 1.589E+07 | 1.068E+03 |
| 2072 | 4.081E+04 | 3.268E+07 | 2.196E+03 | 1.090E+04 | 1.634E+07 | 1.098E+03 |
| 2073 | 4.196E+04 | 3.360E+07 | 2.257E+03 | 1.121E+04 | 1.680E+07 | 1.129E+03 |
| 2074 | 4.315E+04 | 3.455E+07 | 2.321E+03 | 1.152E+04 | 1.727E+07 | 1.161E+03 |
| 2075 | 4.437E+04 | 3.553E+07 | 2.387E+03 | 1.185E+04 | 1.776E+07 | 1.194E+03 |
| 2076 | 4.563E+04 | 3.654E+07 | 2.455E+03 | 1.219E+04 | 1.827E+07 | 1.228E+03 |
| 2077 | 4.693E+04 | 3.758E+07 | 2.525E+03 | 1.254E+04 | 1.879E+07 | 1.263E+03 |
| 2078 | 4.828E+04 | 3.866E+07 | 2.597E+03 | 1.290E+04 | 1.933E+07 | 1.299E+03 |
| 2079 | 4.966E+04 | 3.977E+07 | 2.672E+03 | 1.326E+04 | 1.988E+07 | 1.336E+03 |
| 2080 | 5.109E+04 | 4.091E+07 | 2.749E+03 | 1.365E+04 | 2.045E+07 | 1.374E+03 |
| 2081 | 5.256E+04 | 4.208E+07 | 2.828E+03 | 1.404E+04 | 2.104E+07 | 1.414E+03 |
| 2082 | 5.407E+04 | 4.330E+07 | 2.909E+03 | 1.444E+04 | 2.165E+07 | 1.455E+03 |
| 2083 | 5.563E+04 | 4.455E+07 | 2.993E+03 | 1.486E+04 | 2.227E+07 | 1.497E+03 |
| 2084 | 5.725E+04 | 4.584E+07 | 3.080E+03 | 1.529E+04 | 2.292E+07 | 1.540E+03 |
| 2085 | 5.891E+04 | 4.717E+07 | 3.169E+03 | 1.573E+04 | 2.358E+07 | 1.585E+03 |
| 2086 | 5.774E+04 | 4.623E+07 | 3.107E+03 | 1.542E+04 | 2.312E+07 | 1.553E+03 |
| 2087 | 5.660E+04 | 4.532E+07 | 3.045E+03 | 1.512E+04 | 2.266E+07 | 1.522E+03 |
| 2088 | 5.548E+04 | 4.442E+07 | 2.985E+03 | 1.482E+04 | 2.221E+07 | 1.492E+03 |
| 2089 | 5.438E+04 | 4.354E+07 | 2.926E+03 | 1.452E+04 | 2.177E+07 | 1.463E+03 |
| 2090 | 5.330E+04 | 4.268E+07 | 2.868E+03 | 1.424E+04 | 2.134E+07 | 1.434E+03 |
| 2091 | 5.224E+04 | 4.183E+07 | 2.811E+03 | 1.396E+04 | 2.092E+07 | 1.405E+03 |
| 2092 | 5.121E+04 | 4.101E+07 | 2.755E+03 | 1.368E+04 | 2.050E+07 | 1.378E+03 |
| 2093 | 5.020E+04 | 4.019E+07 | 2.701E+03 | 1.341E+04 | 2.010E+07 | 1.350E+03 |
| 2094 | 4.920E+04 | 3.940E+07 | 2.647E+03 | 1.314E+04 | 1.970E+07 | 1.324E+03 |
| 2095 | 4.823E+04 | 3.862E+07 | 2.595E+03 | 1.288E+04 | 1.931E+07 | 1.297E+03 |
| 2096 | 4.727E+04 | 3.785E+07 | 2.543E+03 | 1.263E+04 | 1.893E+07 | 1.272E+03 |
| 2097 | 4.634E+04 | 3.710E+07 | 2.493E+03 | 1.238E+04 | 1.855E+07 | 1.247E+03 |
| 2098 | 4.542E+04 | 3.637E+07 | 2.444E+03 | 1.213E+04 | 1.818E+07 | 1.222E+03 |
| 2099 | 4.452E+04 | 3.565E+07 | 2.395E+03 | 1.189E+04 | 1.782E+07 | 1.198E+03 |
| 2100 | 4.364E+04 | 3.494E+07 | 2.348E+03 | 1.166E+04 | 1.747E+07 | 1.174E+03 |
| 2101 | 4.277E+04 | 3.425E+07 | 2.301E+03 | 1.143E+04 | 1.713E+07 | 1.151E+03 |
| 2102 | 4.193E+04 | 3.357E+07 | 2.256E+03 | 1.120E+04 | 1.679E+07 | 1.128E+03 |
| 2103 | 4.110E+04 | 3.291E+07 | 2.211E+03 | 1.098E+04 | 1.645E+07 | 1.106E+03 |
| 2104 | 4.028E+04 | 3.226E+07 | 2.167E+03 | 1.076E+04 | 1.613E+07 | 1.084E+03 |
| 2105 | 3.949E+04 | 3.162E+07 | 2.124E+03 | 1.055E+04 | 1.581E+07 | 1.062E+03 |

## Results (Continued)

| Year | Total landfill gas | | | Methane | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2106 | 3.870E+04 | 3.099E+07 | 2.082E+03 | 1.034E+04 | 1.550E+07 | 1.041E+03 |
| 2107 | 3.794E+04 | 3.038E+07 | 2.041E+03 | 1.013E+04 | 1.519E+07 | 1.021E+03 |
| 2108 | 3.719E+04 | 2.978E+07 | 2.001E+03 | 9.933E+03 | 1.489E+07 | 1.000E+03 |
| 2109 | 3.645E+04 | 2.919E+07 | 1.961E+03 | 9.736E+03 | 1.459E+07 | 9.805E+02 |
| 2110 | 3.573E+04 | 2.861E+07 | 1.922E+03 | 9.543E+03 | 1.430E+07 | 9.611E+02 |
| 2111 | 3.502E+04 | 2.804E+07 | 1.884E+03 | 9.354E+03 | 1.402E+07 | 9.421E+02 |
| 2112 | 3.433E+04 | 2.749E+07 | 1.847E+03 | 9.169E+03 | 1.374E+07 | 9.234E+02 |
| 2113 | 3.365E+04 | 2.694E+07 | 1.810E+03 | 8.988E+03 | 1.347E+07 | 9.052E+02 |
| 2114 | 3.298E+04 | 2.641E+07 | 1.774E+03 | 8.810E+03 | 1.320E+07 | 8.872E+02 |
| 2115 | 3.233E+04 | 2.589E+07 | 1.739E+03 | 8.635E+03 | 1.294E+07 | 8.697E+02 |
| 2116 | 3.169E+04 | 2.537E+07 | 1.705E+03 | 8.464E+03 | 1.269E+07 | 8.524E+02 |
| 2117 | 3.106E+04 | 2.487E+07 | 1.671E+03 | 8.297E+03 | 1.244E+07 | 8.356E+02 |
| 2118 | 3.045E+04 | 2.438E+07 | 1.638E+03 | 8.132E+03 | 1.219E+07 | 8.190E+02 |
| 2119 | 2.984E+04 | 2.390E+07 | 1.606E+03 | 7.971E+03 | 1.195E+07 | 8.028E+02 |
| 2120 | 2.925E+04 | 2.342E+07 | 1.574E+03 | 7.813E+03 | 1.171E+07 | 7.869E+02 |
| 2121 | 2.867E+04 | 2.296E+07 | 1.543E+03 | 7.659E+03 | 1.148E+07 | 7.713E+02 |
| 2122 | 2.810E+04 | 2.250E+07 | 1.512E+03 | 7.507E+03 | 1.125E+07 | 7.561E+02 |
| 2123 | 2.755E+04 | 2.206E+07 | 1.482E+03 | 7.358E+03 | 1.103E+07 | 7.411E+02 |
| 2124 | 2.700E+04 | 2.162E+07 | 1.453E+03 | 7.213E+03 | 1.081E+07 | 7.264E+02 |
| 2125 | 2.647E+04 | 2.119E+07 | 1.424E+03 | 7.070E+03 | 1.060E+07 | 7.120E+02 |
| 2126 | 2.594E+04 | 2.077E+07 | 1.396E+03 | 6.930E+03 | 1.039E+07 | 6.979E+02 |
| 2127 | 2.543E+04 | 2.036E+07 | 1.368E+03 | 6.793E+03 | 1.018E+07 | 6.841E+02 |
| 2128 | 2.493E+04 | 1.996E+07 | 1.341E+03 | 6.658E+03 | 9.980E+06 | 6.706E+02 |
| 2129 | 2.443E+04 | 1.956E+07 | 1.315E+03 | 6.526E+03 | 9.782E+06 | 6.573E+02 |
| 2130 | 2.395E+04 | 1.918E+07 | 1.289E+03 | 6.397E+03 | 9.589E+06 | 6.443E+02 |
| 2131 | 2.347E+04 | 1.880E+07 | 1.263E+03 | 6.270E+03 | 9.399E+06 | 6.315E+02 |
| 2132 | 2.301E+04 | 1.843E+07 | 1.238E+03 | 6.146E+03 | 9.213E+06 | 6.190E+02 |
| 2133 | 2.255E+04 | 1.806E+07 | 1.213E+03 | 6.025E+03 | 9.030E+06 | 6.067E+02 |
| 2134 | 2.211E+04 | 1.770E+07 | 1.189E+03 | 5.905E+03 | 8.851E+06 | 5.947E+02 |
| 2135 | 2.167E+04 | 1.735E+07 | 1.166E+03 | 5.788E+03 | 8.676E+06 | 5.830E+02 |
| 2136 | 2.124E+04 | 1.701E+07 | 1.143E+03 | 5.674E+03 | 8.504E+06 | 5.714E+02 |
| 2137 | 2.082E+04 | 1.667E+07 | 1.120E+03 | 5.561E+03 | 8.336E+06 | 5.601E+02 |
| 2138 | 2.041E+04 | 1.634E+07 | 1.098E+03 | 5.451E+03 | 8.171E+06 | 5.490E+02 |
| 2139 | 2.000E+04 | 1.602E+07 | 1.076E+03 | 5.343E+03 | 8.009E+06 | 5.381E+02 |
| 2140 | 1.961E+04 | 1.570E+07 | 1.055E+03 | 5.237E+03 | 7.851E+06 | 5.275E+02 |
| 2141 | 1.922E+04 | 1.539E+07 | 1.034E+03 | 5.134E+03 | 7.695E+06 | 5.170E+02 |
| 2142 | 1.884E+04 | 1.509E+07 | 1.014E+03 | 5.032E+03 | 7.543E+06 | 5.068E+02 |
| 2143 | 1.847E+04 | 1.479E+07 | 9.935E+02 | 4.932E+03 | 7.393E+06 | 4.968E+02 |
| 2144 | 1.810E+04 | 1.449E+07 | 9.738E+02 | 4.835E+03 | 7.247E+06 | 4.869E+02 |
| 2145 | 1.774E+04 | 1.421E+07 | 9.546E+02 | 4.739E+03 | 7.103E+06 | 4.773E+02 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2005 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 5.088E+02 | 2.780E+05 | 1.868E+01 | 1.923E+00 | 5.365E+02 | 3.605E-02 |
| 2007 | 1.472E+03 | 8.039E+05 | 5.402E+01 | 5.562E+00 | 1.552E+03 | 1.043E-01 |
| 2008 | 2.402E+03 | 1.312E+06 | 8.818E+01 | 9.079E+00 | 2.533E+03 | 1.702E-01 |
| 2009 | 3.055E+03 | 1.669E+06 | 1.121E+02 | 1.155E+01 | 3.221E+03 | 2.164E-01 |
| 2010 | 3.667E+03 | 2.004E+06 | 1.346E+02 | 1.386E+01 | 3.867E+03 | 2.598E-01 |
| 2011 | 4.212E+03 | 2.301E+06 | 1.546E+02 | 1.592E+01 | 4.441E+03 | 2.984E-01 |
| 2012 | 4.794E+03 | 2.619E+06 | 1.760E+02 | 1.812E+01 | 5.055E+03 | 3.396E-01 |
| 2013 | 5.327E+03 | 2.910E+06 | 1.955E+02 | 2.013E+01 | 5.616E+03 | 3.773E-01 |
| 2014 | 5.835E+03 | 3.187E+06 | 2.142E+02 | 2.205E+01 | 6.152E+03 | 4.133E-01 |
| 2015 | 6.431E+03 | 3.513E+06 | 2.361E+02 | 2.430E+01 | 6.780E+03 | 4.556E-01 |
| 2016 | 6.905E+03 | 3.772E+06 | 2.534E+02 | 2.610E+01 | 7.280E+03 | 4.892E-01 |
| 2017 | 7.363E+03 | 4.023E+06 | 2.703E+02 | 2.783E+01 | 7.764E+03 | 5.216E-01 |
| 2018 | 7.807E+03 | 4.265E+06 | 2.866E+02 | 2.950E+01 | 8.231E+03 | 5.531E-01 |
| 2019 | 8.230E+03 | 4.496E+06 | 3.021E+02 | 3.110E+01 | 8.677E+03 | 5.830E-01 |
| 2020 | 8.645E+03 | 4.723E+06 | 3.173E+02 | 3.267E+01 | 9.114E+03 | 6.124E-01 |
| 2021 | 9.051E+03 | 4.945E+06 | 3.322E+02 | 3.421E+01 | 9.543E+03 | 6.412E-01 |
| 2022 | 9.449E+03 | 5.162E+06 | 3.468E+02 | 3.571E+01 | 9.963E+03 | 6.694E-01 |
| 2023 | 9.840E+03 | 5.376E+06 | 3.612E+02 | 3.719E+01 | 1.037E+04 | 6.971E-01 |
| 2024 | 1.022E+04 | 5.585E+06 | 3.752E+02 | 3.863E+01 | 1.078E+04 | 7.242E-01 |
| 2025 | 1.060E+04 | 5.790E+06 | 3.890E+02 | 4.005E+01 | 1.117E+04 | 7.508E-01 |
| 2026 | 1.097E+04 | 5.990E+06 | 4.025E+02 | 4.144E+01 | 1.156E+04 | 7.768E-01 |
| 2027 | 1.133E+04 | 6.187E+06 | 4.157E+02 | 4.280E+01 | 1.194E+04 | 8.024E-01 |
| 2028 | 1.168E+04 | 6.380E+06 | 4.287E+02 | 4.414E+01 | 1.231E+04 | 8.274E-01 |
| 2029 | 1.203E+04 | 6.570E+06 | 4.414E+02 | 4.545E+01 | 1.268E+04 | 8.519E-01 |
| 2030 | 1.237E+04 | 6.755E+06 | 4.539E+02 | 4.673E+01 | 1.304E+04 | 8.760E-01 |
| 2031 | 1.270E+04 | 6.937E+06 | 4.661E+02 | 4.799E+01 | 1.339E+04 | 8.995E-01 |
| 2032 | 1.302E+04 | 7.115E+06 | 4.781E+02 | 4.922E+01 | 1.373E+04 | 9.227E-01 |
| 2033 | 1.334E+04 | 7.290E+06 | 4.898E+02 | 5.043E+01 | 1.407E+04 | 9.453E-01 |
| 2034 | 1.366E+04 | 7.461E+06 | 5.013E+02 | 5.161E+01 | 1.440E+04 | 9.675E-01 |
| 2035 | 1.396E+04 | 7.629E+06 | 5.126E+02 | 5.278E+01 | 1.472E+04 | 9.893E-01 |
| 2036 | 1.427E+04 | 7.793E+06 | 5.236E+02 | 5.391E+01 | 1.504E+04 | 1.011E+00 |
| 2037 | 1.456E+04 | 7.954E+06 | 5.345E+02 | 5.503E+01 | 1.535E+04 | 1.032E+00 |
| 2038 | 1.485E+04 | 8.112E+06 | 5.451E+02 | 5.612E+01 | 1.566E+04 | 1.052E+00 |
| 2039 | 1.513E+04 | 8.267E+06 | 5.555E+02 | 5.719E+01 | 1.596E+04 | 1.072E+00 |
| 2040 | 1.541E+04 | 8.419E+06 | 5.657E+02 | 5.824E+01 | 1.625E+04 | 1.092E+00 |
| 2041 | 1.568E+04 | 8.568E+06 | 5.757E+02 | 5.927E+01 | 1.654E+04 | 1.111E+00 |
| 2042 | 1.595E+04 | 8.714E+06 | 5.855E+02 | 6.028E+01 | 1.682E+04 | 1.130E+00 |
| 2043 | 1.621E+04 | 8.857E+06 | 5.951E+02 | 6.127E+01 | 1.709E+04 | 1.149E+00 |
| 2044 | 1.647E+04 | 8.997E+06 | 6.045E+02 | 6.224E+01 | 1.736E+04 | 1.167E+00 |
| 2045 | 1.672E+04 | 9.134E+06 | 6.137E+02 | 6.319E+01 | 1.763E+04 | 1.185E+00 |
| 2046 | 1.697E+04 | 9.269E+06 | 6.228E+02 | 6.412E+01 | 1.789E+04 | 1.202E+00 |
| 2047 | 1.721E+04 | 9.401E+06 | 6.317E+02 | 6.504E+01 | 1.814E+04 | 1.219E+00 |
| 2048 | 1.745E+04 | 9.531E+06 | 6.404E+02 | 6.593E+01 | 1.839E+04 | 1.236E+00 |
| 2049 | 1.768E+04 | 9.657E+06 | 6.489E+02 | 6.681E+01 | 1.864E+04 | 1.252E+00 |
| 2050 | 1.791E+04 | 9.782E+06 | 6.572E+02 | 6.767E+01 | 1.888E+04 | 1.268E+00 |
| 2051 | 1.813E+04 | 9.904E+06 | 6.654E+02 | 6.851E+01 | 1.911E+04 | 1.284E+00 |
| 2052 | 1.835E+04 | 1.002E+07 | 6.734E+02 | 6.934E+01 | 1.934E+04 | 1.300E+00 |
| 2053 | 1.856E+04 | 1.014E+07 | 6.813E+02 | 7.015E+01 | 1.957E+04 | 1.315E+00 |
| 2054 | 1.877E+04 | 1.025E+07 | 6.890E+02 | 7.094E+01 | 1.979E+04 | 1.330E+00 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2055 | 1.895E+04 | 1.035E+07 | 6.956E+02 | 7.162E+01 | 1.998E+04 | 1.343E+00 |
| 2056 | 1.945E+04 | 1.062E+07 | 7.138E+02 | 7.349E+01 | 2.050E+04 | 1.378E+00 |
| 2057 | 1.996E+04 | 1.090E+07 | 7.325E+02 | 7.542E+01 | 2.104E+04 | 1.414E+00 |
| 2058 | 2.048E+04 | 1.119E+07 | 7.518E+02 | 7.741E+01 | 2.160E+04 | 1.451E+00 |
| 2059 | 2.103E+04 | 1.149E+07 | 7.718E+02 | 7.946E+01 | 2.217E+04 | 1.489E+00 |
| 2060 | 2.159E+04 | 1.179E+07 | 7.924E+02 | 8.158E+01 | 2.276E+04 | 1.529E+00 |
| 2061 | 2.217E+04 | 1.211E+07 | 8.136E+02 | 8.378E+01 | 2.337E+04 | 1.570E+00 |
| 2062 | 2.277E+04 | 1.244E+07 | 8.356E+02 | 8.604E+01 | 2.400E+04 | 1.613E+00 |
| 2063 | 2.338E+04 | 1.277E+07 | 8.583E+02 | 8.837E+01 | 2.465E+04 | 1.657E+00 |
| 2064 | 2.402E+04 | 1.312E+07 | 8.817E+02 | 9.078E+01 | 2.533E+04 | 1.702E+00 |
| 2065 | 2.468E+04 | 1.348E+07 | 9.058E+02 | 9.327E+01 | 2.602E+04 | 1.748E+00 |
| 2066 | 2.536E+04 | 1.385E+07 | 9.308E+02 | 9.583E+01 | 2.674E+04 | 1.796E+00 |
| 2067 | 2.606E+04 | 1.424E+07 | 9.565E+02 | 9.848E+01 | 2.747E+04 | 1.846E+00 |
| 2068 | 2.678E+04 | 1.463E+07 | 9.830E+02 | 1.012E+02 | 2.824E+04 | 1.897E+00 |
| 2069 | 2.753E+04 | 1.504E+07 | 1.010E+03 | 1.040E+02 | 2.902E+04 | 1.950E+00 |
| 2070 | 2.830E+04 | 1.546E+07 | 1.039E+03 | 1.069E+02 | 2.983E+04 | 2.005E+00 |
| 2071 | 2.909E+04 | 1.589E+07 | 1.068E+03 | 1.099E+02 | 3.067E+04 | 2.061E+00 |
| 2072 | 2.991E+04 | 1.634E+07 | 1.098E+03 | 1.130E+02 | 3.153E+04 | 2.119E+00 |
| 2073 | 3.075E+04 | 1.680E+07 | 1.129E+03 | 1.162E+02 | 3.242E+04 | 2.178E+00 |
| 2074 | 3.162E+04 | 1.727E+07 | 1.161E+03 | 1.195E+02 | 3.334E+04 | 2.240E+00 |
| 2075 | 3.252E+04 | 1.776E+07 | 1.194E+03 | 1.229E+02 | 3.429E+04 | 2.304E+00 |
| 2076 | 3.344E+04 | 1.827E+07 | 1.228E+03 | 1.264E+02 | 3.526E+04 | 2.369E+00 |
| 2077 | 3.440E+04 | 1.879E+07 | 1.263E+03 | 1.300E+02 | 3.627E+04 | 2.437E+00 |
| 2078 | 3.538E+04 | 1.933E+07 | 1.299E+03 | 1.337E+02 | 3.730E+04 | 2.506E+00 |
| 2079 | 3.640E+04 | 1.988E+07 | 1.336E+03 | 1.375E+02 | 3.837E+04 | 2.578E+00 |
| 2080 | 3.744E+04 | 2.045E+07 | 1.374E+03 | 1.415E+02 | 3.948E+04 | 2.652E+00 |
| 2081 | 3.852E+04 | 2.104E+07 | 1.414E+03 | 1.456E+02 | 4.061E+04 | 2.729E+00 |
| 2082 | 3.963E+04 | 2.165E+07 | 1.455E+03 | 1.498E+02 | 4.178E+04 | 2.807E+00 |
| 2083 | 4.077E+04 | 2.227E+07 | 1.497E+03 | 1.541E+02 | 4.299E+04 | 2.889E+00 |
| 2084 | 4.195E+04 | 2.292E+07 | 1.540E+03 | 1.586E+02 | 4.424E+04 | 2.972E+00 |
| 2085 | 4.317E+04 | 2.358E+07 | 1.585E+03 | 1.632E+02 | 4.552E+04 | 3.058E+00 |
| 2086 | 4.232E+04 | 2.312E+07 | 1.553E+03 | 1.599E+02 | 4.462E+04 | 2.998E+00 |
| 2087 | 4.148E+04 | 2.266E+07 | 1.522E+03 | 1.568E+02 | 4.373E+04 | 2.938E+00 |
| 2088 | 4.066E+04 | 2.221E+07 | 1.492E+03 | 1.537E+02 | 4.287E+04 | 2.880E+00 |
| 2089 | 3.985E+04 | 2.177E+07 | 1.463E+03 | 1.506E+02 | 4.202E+04 | 2.823E+00 |
| 2090 | 3.906E+04 | 2.134E+07 | 1.434E+03 | 1.476E+02 | 4.119E+04 | 2.767E+00 |
| 2091 | 3.829E+04 | 2.092E+07 | 1.405E+03 | 1.447E+02 | 4.037E+04 | 2.713E+00 |
| 2092 | 3.753E+04 | 2.050E+07 | 1.378E+03 | 1.418E+02 | 3.957E+04 | 2.659E+00 |
| 2093 | 3.679E+04 | 2.010E+07 | 1.350E+03 | 1.390E+02 | 3.879E+04 | 2.606E+00 |
| 2094 | 3.606E+04 | 1.970E+07 | 1.324E+03 | 1.363E+02 | 3.802E+04 | 2.555E+00 |
| 2095 | 3.535E+04 | 1.931E+07 | 1.297E+03 | 1.336E+02 | 3.727E+04 | 2.504E+00 |
| 2096 | 3.465E+04 | 1.893E+07 | 1.272E+03 | 1.309E+02 | 3.653E+04 | 2.454E+00 |
| 2097 | 3.396E+04 | 1.855E+07 | 1.247E+03 | 1.283E+02 | 3.581E+04 | 2.406E+00 |
| 2098 | 3.329E+04 | 1.818E+07 | 1.222E+03 | 1.258E+02 | 3.510E+04 | 2.358E+00 |
| 2099 | 3.263E+04 | 1.782E+07 | 1.198E+03 | 1.233E+02 | 3.440E+04 | 2.311E+00 |
| 2100 | 3.198E+04 | 1.747E+07 | 1.174E+03 | 1.209E+02 | 3.372E+04 | 2.266E+00 |
| 2101 | 3.135E+04 | 1.713E+07 | 1.151E+03 | 1.185E+02 | 3.305E+04 | 2.221E+00 |
| 2102 | 3.073E+04 | 1.679E+07 | 1.128E+03 | 1.161E+02 | 3.240E+04 | 2.177E+00 |
| 2103 | 3.012E+04 | 1.645E+07 | 1.106E+03 | 1.138E+02 | 3.176E+04 | 2.134E+00 |
| 2104 | 2.952E+04 | 1.613E+07 | 1.084E+03 | 1.116E+02 | 3.113E+04 | 2.091E+00 |
| 2105 | 2.894E+04 | 1.581E+07 | 1.062E+03 | 1.094E+02 | 3.051E+04 | 2.050E+00 |

## Results (Continued)

| Year | Carbon dioxide | | | NMOC | | |
|---|---|---|---|---|---|---|
| | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* | *(Mg/year)* | *($m^3$/year)* | *(av ft^3/min)* |
| 2106 | 2.837E+04 | 1.550E+07 | 1.041E+03 | 1.072E+02 | 2.991E+04 | 2.009E+00 |
| 2107 | 2.780E+04 | 1.519E+07 | 1.021E+03 | 1.051E+02 | 2.932E+04 | 1.970E+00 |
| 2108 | 2.725E+04 | 1.489E+07 | 1.000E+03 | 1.030E+02 | 2.873E+04 | 1.931E+00 |
| 2109 | 2.671E+04 | 1.459E+07 | 9.805E+02 | 1.010E+02 | 2.817E+04 | 1.892E+00 |
| 2110 | 2.618E+04 | 1.430E+07 | 9.611E+02 | 9.896E+01 | 2.761E+04 | 1.855E+00 |
| 2111 | 2.567E+04 | 1.402E+07 | 9.421E+02 | 9.700E+01 | 2.706E+04 | 1.818E+00 |
| 2112 | 2.516E+04 | 1.374E+07 | 9.234E+02 | 9.508E+01 | 2.653E+04 | 1.782E+00 |
| 2113 | 2.466E+04 | 1.347E+07 | 9.052E+02 | 9.320E+01 | 2.600E+04 | 1.747E+00 |
| 2114 | 2.417E+04 | 1.320E+07 | 8.872E+02 | 9.135E+01 | 2.549E+04 | 1.712E+00 |
| 2115 | 2.369E+04 | 1.294E+07 | 8.697E+02 | 8.954E+01 | 2.498E+04 | 1.678E+00 |
| 2116 | 2.322E+04 | 1.269E+07 | 8.524E+02 | 8.777E+01 | 2.449E+04 | 1.645E+00 |
| 2117 | 2.276E+04 | 1.244E+07 | 8.356E+02 | 8.603E+01 | 2.400E+04 | 1.613E+00 |
| 2118 | 2.231E+04 | 1.219E+07 | 8.190E+02 | 8.433E+01 | 2.353E+04 | 1.581E+00 |
| 2119 | 2.187E+04 | 1.195E+07 | 8.028E+02 | 8.266E+01 | 2.306E+04 | 1.549E+00 |
| 2120 | 2.144E+04 | 1.171E+07 | 7.869E+02 | 8.102E+01 | 2.260E+04 | 1.519E+00 |
| 2121 | 2.101E+04 | 1.148E+07 | 7.713E+02 | 7.942E+01 | 2.216E+04 | 1.489E+00 |
| 2122 | 2.060E+04 | 1.125E+07 | 7.561E+02 | 7.784E+01 | 2.172E+04 | 1.459E+00 |
| 2123 | 2.019E+04 | 1.103E+07 | 7.411E+02 | 7.630E+01 | 2.129E+04 | 1.430E+00 |
| 2124 | 1.979E+04 | 1.081E+07 | 7.264E+02 | 7.479E+01 | 2.087E+04 | 1.402E+00 |
| 2125 | 1.940E+04 | 1.060E+07 | 7.120E+02 | 7.331E+01 | 2.045E+04 | 1.374E+00 |
| 2126 | 1.901E+04 | 1.039E+07 | 6.979E+02 | 7.186E+01 | 2.005E+04 | 1.347E+00 |
| 2127 | 1.864E+04 | 1.018E+07 | 6.841E+02 | 7.044E+01 | 1.965E+04 | 1.320E+00 |
| 2128 | 1.827E+04 | 9.980E+06 | 6.706E+02 | 6.904E+01 | 1.926E+04 | 1.294E+00 |
| 2129 | 1.791E+04 | 9.782E+06 | 6.573E+02 | 6.767E+01 | 1.888E+04 | 1.269E+00 |
| 2130 | 1.755E+04 | 9.589E+06 | 6.443E+02 | 6.633E+01 | 1.851E+04 | 1.243E+00 |
| 2131 | 1.720E+04 | 9.399E+06 | 6.315E+02 | 6.502E+01 | 1.814E+04 | 1.219E+00 |
| 2132 | 1.686E+04 | 9.213E+06 | 6.190E+02 | 6.373E+01 | 1.778E+04 | 1.195E+00 |
| 2133 | 1.653E+04 | 9.030E+06 | 6.067E+02 | 6.247E+01 | 1.743E+04 | 1.171E+00 |
| 2134 | 1.620E+04 | 8.851E+06 | 5.947E+02 | 6.123E+01 | 1.708E+04 | 1.148E+00 |
| 2135 | 1.588E+04 | 8.676E+06 | 5.830E+02 | 6.002E+01 | 1.675E+04 | 1.125E+00 |
| 2136 | 1.557E+04 | 8.504E+06 | 5.714E+02 | 5.883E+01 | 1.641E+04 | 1.103E+00 |
| 2137 | 1.526E+04 | 8.336E+06 | 5.601E+02 | 5.767E+01 | 1.609E+04 | 1.081E+00 |
| 2138 | 1.496E+04 | 8.171E+06 | 5.490E+02 | 5.653E+01 | 1.577E+04 | 1.060E+00 |
| 2139 | 1.466E+04 | 8.009E+06 | 5.381E+02 | 5.541E+01 | 1.546E+04 | 1.039E+00 |
| 2140 | 1.437E+04 | 7.851E+06 | 5.275E+02 | 5.431E+01 | 1.515E+04 | 1.018E+00 |
| 2141 | 1.409E+04 | 7.695E+06 | 5.170E+02 | 5.323E+01 | 1.485E+04 | 9.979E-01 |
| 2142 | 1.381E+04 | 7.543E+06 | 5.068E+02 | 5.218E+01 | 1.456E+04 | 9.781E-01 |
| 2143 | 1.353E+04 | 7.393E+06 | 4.968E+02 | 5.115E+01 | 1.427E+04 | 9.587E-01 |
| 2144 | 1.327E+04 | 7.247E+06 | 4.869E+02 | 5.013E+01 | 1.399E+04 | 9.398E-01 |
| 2145 | 1.300E+04 | 7.103E+06 | 4.773E+02 | 4.914E+01 | 1.371E+04 | 9.212E-01 |

# ATTACHMENT B

# FORM FF AND CHECK COPY

United States Environmental Protection Agency

OMB No. 2060-0336, Approval Expires 06/30/2015

Federal Operating Permit Program (40 CFR Part 71)

**FEE FILING FORM (FF)**

Complete this form each time you prepare form **FEE** and send this form to the appropriate lockbox bank address, along with full payment. This form required at time of initial fee payment, and thereafter, when paying annual fees.

Source or Facility Name Tekoi Landfill

Source Location Skull Valley Indian Reservation, Toole County, Utah

EPA Region where Source Located Region 8

Mailing Address:

Street/P.O. Box 6976 West California Avenue City Salt Lake City

State UT ZIP 84104 - 

Contact Person: Brad Kloos Title District Manager

Telephone ( 801 ) 731 - 5542 Ext. 

**Total Fee Payment Remitted:** $ 998.60

**SCS ENGINEERS**

*Environmental Consultants*

3900 Kilroy Airport Way, Suite 100
Long Beach, CA 90806-6816
562 426-9544
FIN 54-0913440

**MUFG UNION BANK, N.A.**
445 Figueroa Street
Los Angeles, CA 90071

16-49
1220

272699

*CHECK DATE*
March 24, 2015

*PAY* Nine Hundred Ninety Eight and 60/100 Dollars

*AMOUNT* 998.60

*TO* EPA REGION 8 - AIR PERMITTING
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129

TWO SIGNATURES REQUIRED OVER FIVE THOUSAND DOLLARS
VOID IF NOT CASHED IN 90 DAYS

Noda Harlow

⑈272699⑈ ⑆122000496⑆ 5320121487⑈

## Bove, Leslie

**From:** trackingupdates@fedex.com
**Sent:** Tuesday, March 31, 2015 8:21 AM
**To:** Bove, Leslie
**Subject:** FedEx Shipment 773245224866 Delivered

fedex.com | Ship | Track | Manage | Learn | Office/Print Services

# Your package has been delivered

## Tracking # 773245224866

Ship (P/U) date:
Monday, 3/30/15

**Michael Newman**
SCS ENGINEERS
SANTA ROSA, CA 95403
US

Delivered

Delivery date:
Tuesday, 3/31/15 10:16 AM

**Government Lockbox 979078**
**US**
U.S. Bank
1005 CONVENTION PLZ MAIL STATION SL-MO-C2GL
SAINT LOUIS, MO 63101
US

## Shipment Facts

Our records indicate that the following package has been delivered.

| | |
|---|---|
| **Tracking number:** | 773245224866 |
| **Status:** | Delivered: 03/31/2015 10:16 AM Signed for By: M.EBEL |
| **Reference:** | 01207310.00 T34 |
| **Signed for by:** | M.EBEL |
| **Delivery location:** | SAINT LOUIS, MO |
| **Delivered to:** | Mailroom |
| **Service type:** | FedEx Priority Overnight |
| **Packaging type:** | FedEx Pak |
| **Number of pieces:** | 1 |
| **Weight:** | 1.00 lb. |
| **Special handling/Services:** | Deliver Weekday |

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 10:21 AM CDT on 03/31/2015.

To learn more about FedEx Express, please go to fedex.com.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above, or go to fedex.com.

This tracking update has been sent to you by FedEx at your request. FedEx does not validate the authenticity of the requestor and does not validate, guarantee or warrant the authenticity of the request, the requestor's message, or the accuracy of this tracking update. For tracking results and terms of use, go to fedex.com.

Thank you for your business.

## Bove, Leslie

**From:** trackingupdates@fedex.com
**Sent:** Tuesday, March 31, 2015 8:45 AM
**To:** Bove, Leslie
**Subject:** FedEx Shipment 773245266840 Delivered

fedex.com | Ship | Track | Manage | Learn | Office/Print Services

# Your package has been delivered

## Tracking # 773245266840

Ship (P/U) date:
Monday, 3/30/15

**Michael Newman**
SCS ENGINEERS
SANTA ROSA, CA 95403
US

Delivered

Delivery date:
Tuesday, 3/31/15 9:38 AM

**co Claudia Smith**
EPA, Region VIII
1595 WYNKOOP ST AIR
PERMITTING
DENVER, CO 80202
US

## Shipment Facts

Our records indicate that the following package has been delivered.

| | |
|---|---|
| **Tracking number:** | 773245266840 |
| **Status:** | Delivered: 03/31/2015 09:38 AM Signed for By: .THOMAS |
| **Reference:** | 01207310.00 T34 |
| **Signed for by:** | .THOMAS |
| **Delivery location:** | DENVER, CO |
| **Delivered to:** | Receptionist/Front Desk |
| **Service type:** | FedEx Priority Overnight |
| **Packaging type:** | FedEx Pak |
| **Number of pieces:** | 1 |
| **Weight:** | 1.00 lb. |
| **Special handling/Services:** | Deliver Weekday |

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 10:44 AM CDT on 03/31/2015.

To learn more about FedEx Express, please go to fedex.com.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above, or go to fedex.com.

This tracking update has been sent to you by FedEx at your request. FedEx does not validate the authenticity of the requestor and does not validate, guarantee or warrant the authenticity of the request, the requestor's message, or the accuracy of this tracking update. For tracking results and terms of use, go to fedex.com.

Thank you for your business.

# Appendix J

## GHG Fee Adjustment Payment Letter (March 2016)

Environmental Consultants
and Contractors

3117 Fite Circle.
Suite 108
Sacramento, CA 95827

916-361-1297
FAX 916-361-1299
www.scsengineers.com

SCS ENGINEERS

March 22, 2016
File No. 01207310.00, Task 34

Part 71 Contact
c/o Noreen Okubo
Air Permitting, Monitoring and Modeling Unit
EPA Region 8
1595 Wynkoop Street (8P-AR)
Denver, CO 80202-1129
Ph: 303-312-6520

**SUBJECT: TITLE V FEE PAYMENT**
**TEKOI LANDFILL, TOOELE COUNTY, UTAH**
**PERMIT NO. (V-SV-00001-2010.00)**

Dear Ms. Okubo:

On behalf of Waste Management of Utah, Inc. (WM), SCS Engineers (SCS) is submitting the required form for payment of the GHG Fee Adjustment, as you advised in our March 21, 2016 telephone communication. We are submitting this one-time fee payment outside the normal annual fee calculation and payment process, and including it in the Title V permit renewal application process, for the Tekoi Landfill located in Tooele County, Utah. A copy of this submittal has been included in the application.

SCS has completed the enclosed Fee Calculation Worksheet (Form FEE) showing the $520 GHG Fee Adjustment and a check for that amount is enclosed.

A Certification of Truth, Accuracy, and Completeness (CTAC) form signed by a responsible official from WM is also enclosed.

If you have any questions regarding this submittal or require any additional information, please contact the undersigned at (707) 546-9461.

Sincerely,

Michael O'Connor
Senior Project Professional
SCS ENGINEERS

Enclosures: Form FEE, CTAC Form, Check

cc: U.S. Bank
Government Lockbox 979078
US EPA FOIA & Misc. Payments
1005 Convention Plaza
Mail Station SL-MO-C2-GL
St. Louis, MO 63101
Contact: Natalie Pearson (U.S. Bank)
314-418-4087

Mark Franc, WM – electronic copy
Doc Nyiro, WM – electronic copy

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 06/30/2015
(Approval extended during OMB review)

Federal Operating Permit Program (40 CFR Part 71)

**FEE CALCULATION WORKSHEET (FEE)**

Use this form initially, or thereafter on an annual basis, to calculate part 71 fees.

**A. General Information**

Type of fee (Check one): _X__Initial ___Annual **(GHG Adjustment Fee only)**

Deadline for submitting fee calculation worksheet ____/____/_____ (submitted as part of Title V renewal application)

For initial fees, emissions are based on (Check one): NA (GHG Adjustment fee only)

___ Actual emissions for the preceding calendar year. (Required in most circumstances.)

___ Estimates of actual emissions for the current calendar year. (Required when operations commenced during the preceding calendar year.)

Date commenced operations ____/____/_____

___ Estimates of actual emissions for the preceding calendar year. (Optional after a part 71 permit was issued to replace a part 70 permit, but only if initial fee payment is due between January 1 and March 31; otherwise use actual emissions for the preceding calendar year.)

For annual fee payment, you are required to use actual emissions for the preceding calendar year.

**B. Source Information:** Complete this section only if you are paying fees but not applying for a permit.

Source or facility name __Tekoi Landfill_____

Mailing address: Street or P.O. Box ___6976 West California Avenue_____

City___Salt Lake City _____ State_Utah_____ ZIP__84104___ - _____

Contact person__Brad Kloos_____ Title__Senior District Manager_____

Telephone (_801_) _605 - 1954_____ Ext_____ Part 71 permit no. _____

**C. Certification of Truth, Accuracy and Completeness**: Only needed if not submitting a separate form CTAC. **(Form CTAC attached)**

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in this submittal (form and attachments) are true, accurate and complete.

Name (signed) _____

Name (typed) _____ Date:____ /____ /_____

**D. Annual Emissions Report for Fee Calculation Purposes -- Non-HAP (NA – GHG Adjust. Fee only)**

You may use this to report actual emissions (tons per year) of regulated pollutants (for fee calculation) on a calendar-year basis for both initial and annual fee calculation purposes. Section E is designed to report HAP emissions. Quantify all actual emissions, including fugitives, but do not include insignificant emissions and certain regulated air pollutants that are not counted for fee purposes, such as CO and GHGs (see instructions). Sum the emissions in each column to calculate subtotals. Subtotals should be reported to the nearest tenth (0.1) of a ton at the bottom of the page. If any subtotal exceeds 4,000 tons, enter 4,000 for that column.

This data is for _____ (year)

| Emission Unit ID | NOx | VOC | SO2 | PM10 | Lead | Other |
|---|---|---|---|---|---|---|
| | | | | | | |
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| **SUBTOTALS:** | | | | | | |

**E. Annual Emissions Report for Fee Calculation Purposes – HAP (NA – GHG Adjust. Fee only)**

HAP Identification. Identify individual HAP emitted at the facility, identify the CAS number, and assign a unique identifier for use in the second table in this section. Whenever assigning identifier codes, use "HAP1" for the first, "HAP2" for the second, and so on.

| Name of HAP | CAS No | Identifier |
|---|---|---|
| | | |
| | | |
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| | | |
| | | |
| | | |
| | | |

HAP Emissions. Report the actual emissions of individual HAP identified above. Use the identifiers assigned in the table above. Include all emissions, including fugitives, and do not include insignificant emissions. Sum the emissions in each column to calculate subtotals. Report subtotals to the nearest tenth (0.1) of a ton at the bottom of the page. If any subtotal exceeds 4,000 tons, enter 4,000.

This data is for _____ (year)

| Emissions Unit ID | Actual Emissions (Tons/Year) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | HAP___ | HAP___ | HAP___ | HAP___ | HAP___ | HAP___ | HAP___ | HAP___ |
| | | | | | | | | |
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| **SUBTOTALS:** | | | | | | | | |

## F. Fee Calculation Worksheet

This worksheet is used to calculate the total fee owed (including the emissions-based fee and the GHG fee adjustment) for both initial and annual fee payment purposes. Reconciliation is only for cases where you are paying the annual fee and you used any type of estimate of actual emissions when you calculated the initial fee. If you do not need to reconcile fees, complete line 1-5 (emissions summary) and then skip down to line 21 (emission calculation). See instructions for more detailed explanation.

**EMISSIONS SUMMARY (GHG Adjustment Fee only, Title V Renewal application; annual fee calculation will be provided as a separate submittal)**

| | |
|---|---|
| 1. Sum the subtotals from section D of this form (non-HAP) and enter the total, rounded to the nearest tenth (0.1) of a ton. | 0.0 |
| 2. Sum the subtotals from section E of this form (HAP) and enter the total, rounded to the nearest tenth (0.1) of a ton. | 0.0 |
| 3. Sum lines 1 and 2. | 0.0 |
| 4. Enter the emissions that were counted twice. If none, enter "0." | |
| 5. Subtract line 4 from line 3, round to the nearest ton, and enter the result here. This is the **total emissions** that count for fees purposes. | |

**RECONCILIATION (WHEN INITIAL FEES WERE BASED ON ESTIMATES FOR THE "CURRENT" CALENDAR YEAR)**

Only complete lines 6-10 if you are paying the first annual fee and initial fees were based on estimated actual emissions for the calendar year in which you paid initial fees; otherwise skip to line 11 or to line 21.

| | |
|---|---|
| 6. Enter the total estimated actual emissions for the year the initial fee was paid (previously reported on line 5 of the initial fee form). | |
| 7. If line 5 is greater than line 6, subtract line 6 from line 5, and enter the result. Otherwise enter "0." | |
| 8. If line 6 is greater than line 5, subtract line 5 from line 6, and enter the result. Otherwise enter "0." | |
| 9. If line 7 is greater than 0, multiply line 7 by last year's fee rate ($/ton) and enter the result here. This is the underpayment. Go to line 21. | |
| 10. If line 8 is greater than 0, multiply line 8 by last year's fee rate ($/ton) and enter the result here. This is the overpayment. Go to line 21. | |

**RECONCILIATION (WHEN INITIAL FEES WERE BASED ON ESTIMATES FOR THE "PRECEDING" CALENDAR YEAR)**

Only complete lines 11-20 if you are paying the first annual fee and initial fees were based on estimated actual emissions for the calendar year preceding initial fee payment; otherwise skip to line 21. If completing this section, you will also need to complete sections D and E to report actual emissions for the calendar year preceding initial fee payment.

| | |
|---|---|
| 11. Sum the actual emissions from section D (non-HAP) for the calendar year preceding initial fee payment and enter the result here. | |
| 12. Sum the actual emissions from section E (HAP) for the calendar year preceding initial fee payment and enter the result here. | |

| | |
|---|---|
| 13. Add lines 11 and 12 and enter the total here. These are total actual emissions for the calendar year preceding initial fee payment. | |
| 14. Enter double counted emission from line 13 here. If none, enter "0." | |
| 15. Subtract line 14 from line 13, round to the nearest ton, and enter the result here. | |
| 16. Enter the total estimated actual emissions previously reported on line 5 of the initial fee form. These are estimated actual emissions for the calendar year preceding initial fee payment. | |
| 17. If line 15 is greater than line 16, subtract line 16 from line 15, and enter the result here. Otherwise enter "0." | |
| 18. If line 16 is greater than line 15, subtract line 15 from line 16, and enter the result here. Otherwise enter "0." | |
| 19. If line 17 is greater than 0, multiply line 17 by last year's fee rate ($/ton) and enter the result here. This is the underpayment. | |
| 20. If line 18 is greater than 0, multiply line 18 by last year's fee rate ($/ton) and enter the result on this line. This is the overpayment. | |
| **EMISSION FEE CALCULATION** | |
| 21. Multiply line 5 (tons) by the current fee rate ($/ton) and enter the result here. This is the unadjusted emissions fee. Continue on to line 23. | 0.0 |
| **GHG FEE ADJUSTMENT** | |
| 23. If you are submitting an initial permit application and this is the first time you are paying fees, enter $2,236, otherwise enter "0". [Note that any updates to the initial application are covered under this one-time charge.] | |
| 24. Enter the number of permit modifications (or related permit actions) you have submitted to the permitting authority since you last paid fees. If none, skip to line 26. | |
| 25. Multiply the number in line 24 by $365 and enter the result. | |
| 26. If you have submitted a permit renewal application since the last time you paid fees enter $520, otherwise enter "0" | $520 |
| 27. Sum line 23, 25, and 26 and enter the result. This is the GHG fee adjustment | $520 |
| **OTHER ADJUSTMENTS** | |
| 28. Add the total on line 21 and the total on line 27 and enter the result. | |
| 29. Enter any underpayment from line 9 or 19 here. Otherwise enter "0." | |
| 30. Enter any overpayment from line 10 or 20 here. Otherwise enter "0." | |
| 31. If line 29 is greater than "0," add it to line 28 and enter the result here. If line 30 is greater than "0," subtract this from line 28 and enter the result here. Otherwise enter the amount on line 28 here. This is the fee adjusted for over/underpayment**.** | |
| 32. Enter any credit for fee assessment error here. Otherwise, enter "0." | |
| 33. Subtract line 32 from line 31 and enter the result here. Stop here. This is the **TOTAL FEE (AFTER ADJUSTMENTS)** that you must remit to EPA. | $520 |

United States Environmental Protection Agency

OMB No. 2060-0336, Expires 6/30/2015
(Approval extended during OMB review)

Federal Operating Permit Program (40 CFR Part 71)

**CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)**

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

**A. Responsible Official**

Name: (Last) Bradley (First) Scott (MI) ____

Title Area Vice President

Street or P.O. Box 222 S. Mill Avenue, Suite 333

City Tempe State AZ ZIP 85281 - _____

Telephone (480) 457-4810 Ext. _____ Facsimile (866) 404-8396

**B. Certification of Truth, Accuracy and Completeness** (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) _____

Name (typed) Scott Bradley Date: 3 / 18 / 16

**SCS ENGINEERS**

*Environmental Consultants*

3900 Kilroy Airport Way, Suite 100
Long Beach, CA 90806-6816
562 426-9544
FIN 54-0913440

**MUFG UNION BANK, N.A.**
445 Figueroa Street
Los Angeles, CA 90071

16-49
1220

286294

*CHECK DATE*
March 21, 2016

*PAY* Five Hundred Twenty and 00/100 Dollars

520.00
*AMOUNT*

*TO* EPA-REGION 7
PO Box 360748M
Pittsburgh, PA 15251

TWO SIGNATURES REQUIRED OVER FIVE THOUSAND DOLLARS
VOID IF NOT CASHED IN 90 DAYS

Nada Harlow

⑈286294⑈ ⑆122000496⑆ 5320121487⑈

S C S ENGINEERS
FIN- 54-0913440

Check Date: 3/21/2016

286294

| Invoice Number | Date | Voucher | Amount | Discounts | Previous Pay | Net Amount |
|---|---|---|---|---|---|---|
| Permit0120731000 | 3/21/2016 | 0164537 | 520.00 | | | 520.00 |
| EPA-REGION 7 | | TOTAL | 520.00 | | | 520.00 |
| Union Bank-Accts Payable 2 | | 0133800 | | | | |

S C S ENGINEERS
FIN- 54-0913440