

State of Washington
Department of Ecology
Technical Support Document (TSD)

Source Background and Description

Source Name:	Pasco Sanitary Landfill
	1901 Dietrich Road, Pasco, WA
Source Location:	SW ¼ of the NW1/4 of Section 22, Range 30, Township
	9, WM
County:	Franklin
SIC Code:	
Approval Order No.:	Synthetic Minor 16AQ-E031
Permit Engineer:	Robert Koster

Introduction

An initial performance test conducted on the GCE RTO authorized by Approval Order No. 14AQ-E571 found that the GCE RTO was not achieving emission limits proposed in the NOC application and required by the conditions of the Approval Order. Several months of trouble-shooting and testing of the unit ensued with the general conclusion that the GCE RTO could not be made to achieve the BACT/t-BACT limits of the 14AQ-E571 Approval Order. The applicants hired several experts and engaged the services of Anguil Environmental Systems to evaluate replacing the RTO with an Anguil unit. It was determined that an Anguil RTO, Model 25, 2,500 SCFM would be able to comply with the emission limits established as BACT and t-BACT for the 2014 GCE Unit. Additionally, the Anguil unit would be designed to operate at approximately the same gas flows and dilution air flows, so that most (all) of the analyses for the failed RTO could be used for the new unit.

An NOC application for the Anguil unit was received by Ecology on October 27, 2016. Preliminary Determination No. 16AQ-E031 was prepared to provide the new RTO draft approval to the public for comment. The conditions of 16AQ-E031 are similar to those of the 2014 approval, but with the replacement of destruction and removal efficiencies (DRE) that were removed from the 2014 approval at the applicant's request. The DRE are the basis of the BACT and t-BACT findings of the approval and were thought by the applicant to be duplicative and too costly to confirm via testing. Having experienced the failure of the GCE RTO, Ecology now insists that the DRE limits be explicit and has instead found most of the mass emission rates in the 2014 approval to be unnecessary.

History

On October 27, 2016, the Industrial Waste Area Generators Group (IWAG) responsible for the clean-up of Zone A (the 40,000 drum hazardous waste deposit at the Pasco Sanitary Landfill) submitted a Notice of Construction (NOC) application for an Anguil RTO unit to replace the failed GCE RTO which was installed to oxidize soil vapors from the Zone A soil vapor extraction (SVE) system. The SVE system is currently operated as part of an interim action cleanup strategy for the IWAG to prevent the spread of subsurface contaminants from Zone A, under Agreed Order No. 9240.

Permitted Emission Units and Pollution Control Equipment

The AQP issued an approval for an RTO to control the potential emissions from the Zone A SVE system on July 30, 2015: Approval Order No. 14AQ-E571 approved a GCE RTO that was found not to function as well as necessary to reach t-BACT DREs guaranteed by the manufacturer. A Notice of Violation (Docket No. 13240) was issued to the responsible official (Thom Morin, Environmental Partners, Inc.) for the GCE failure. After much examination and testing, it was determined that the GCE unit could not even be retrofit and guaranteed to meet the 98% DREs required for t-BACT. Anguil Environmental Systems, Inc. was contracted by the responsible parties to replace the GCE unit with one of their own. In the interim period, while Anguil designs and installs the replacement RTO, an administrative order (Docket # 13922) required that a temporary unit be used in place of the GCE unit. An Anguil rental recuperative thermal oxidizer (RcTO) capable of DREs higher than the guarantees received for the RTOs (99.5% vs. 98%) but with maximum SVE flow capacity about one half of the RTOs, has been operated since mid-December at the site. The administrative order requires that the Anguil replacement RTO be operating by June 1, 2017.

Unpermitted Emission Units and Pollution Control Equipment

The SVE control device required by administrative order at this site has not received an approval order from the AQP. The device, an Anguil RcTO, is required by the AQP for the period of time between shut-down of the failed GCE RTO and start-up of a new Anguil unit capable of meeting the BACT and t-BACT limits of the AQP. During this interim period, the RcTO will be controlling SVE gases more efficiently (DRE 99.5%) than the RTO (98%) that will be the longer-term equipment required at this site. The RcTO has a capacity for SVE gas about half that of the RTO. Both the higher DRE and the lower capacity result in lower emissions from this unit than will result from operation of the RTO, thus removing the need for a specific health risk assessment for the interim period prior to start-up of the new RTO.

New Emission Units and Pollution Control Equipment

The new emission unit and control equipment that is the subject of the revised preliminary determination is the Anguil Environmental Systems, Inc. Regenerative Thermal Oxidizer described in Anguil proposal # AES-168058F. The Anguil unit (Anguil RTO, Model 25, 2,500 SCFM) is designed to process up to 1000 scfm of soil gas and to

avoid all of the design flaws that prevented the GCE unit from achieving the BACT and t-BACT limits for the unit. Additional specifications of the system that will improve its air emission performance include that the approach to lower explosive limits in the gas at the inlet to the RTO have been reduced from 40% to 25% due to applicant safety concerns, that condensate will not be treated by the RTO, and that SVE gas flows, currently at about 400 scfm, cannot be increased significantly without exceeding limits established to avoid subsurface combustion problems (subsurface temperature and CO limits). In combination, the limitations assure satisfaction of synthetic minor permit status (< 10 tons per year of a single HAP – HCl) and prevent health impacts of concern.

Existing Approval Orders

The GCE RTO, first permitted at this site in 2014, was approved under Approval Order No. 14AQ-E571. As noted above, the unit failed to satisfy the conditions of approval in Approval Order No. 14AQ-E571 and was issued Notice of Violation (NOV) No. 13240. When it became clear the GCE unit would not be possible to retrofit to the conditions of approval, a replacement unit was proposed and a vendor with a better track record selected to build it (Anguil). During the period of time that design, permitting, and installation requires for the new unit, Anguil has provided a rental Recuperative TO that reaches a slightly higher destruction efficiency than the RTOs will. The interim requirements until the Anguil RTO is operating are outlined in an administrative order (Docket No. 13922). The new RTO will be issued Synthetic Minor Approval Order No. 16AQ-E031.

Stack Summary

There is one stack for the RTO which has been evaluated for this project. In the past, the SVE gases were co-fired in the flare that combusted gases generated in the municipal solid waste part of the landfill. The municipal solid waste gases will be separated from the SVE gases and will continue to be combusted in the flare.

Enforcement Issue(s)

The initial performance test of the GCE RTO installed in 2014 produced data showing the unit was not performing close to expectations and permitted emission rates. Further testing and evaluation by the IWAG's experts found that the unit was not going to achieve the limits even if retrofit. Ecology issued NOV No. 13240 to the designated responsible official for the GCE unit (Thom Morin at EPI, Inc.). To address necessary control of SVE system gases in the period between discovery of the GCE unit failure and start-up of a replacement unit, Ecology issued administrative order No. 13922 which established requirements for a temporary SVE gas control device and a schedule for start-up of the replacement RTO. Ecology does not expect to take further action on the GCE NOV if the requirements of the administrative order are satisfied.

Recommendation

Staff recommends that the construction and operation of the Anguil RTO facility be approved. This recommendation is based on the following facts and conditions:

Information used in this review was derived from the revised application (received October 26, 2016) and the unchanged Second Tier Health Impact Assessment prepared for the GCE RTO. The operating features of the Anguil unit are the same as the GCE unit it replaces except for the following, which tend to reduce impacts of the emissions:

1. The Anguil RTO Stack will be higher, improving dispersion.
2. The Anguil RTO temperature limit is controlled more accurately, improving oxidation of contaminants.
3. The fraction of the LEL allowed in the inlet gases has been reduced from 40% to 25%, reducing the loading on the RTO.

A complete application for the purposes of this review was received on October 26, 2016.

Emission Calculations

See appendix A for emission estimates.

Actual Emissions

No previous emission data has been received by the air quality program from the proposed source. Data was collected for the GCE RTO that failed. These showed that, with all the operational restrictions (reduced approach to LEL, lower SVE flows to avoid subsurface combustion) placed on the new unit, actual emissions will be considerably lower than the worst-case maxima used in the Ecology evaluations of this source.

Limited Potential to Emit

The source shall limit total VOC emissions to a maximum of 0.7 lb/hr and HCl to 2.066 lb/hr at the outlet of the RTO. The source must also demonstrate and continue to demonstrate that the RTO will result in a 98% destruction/removal efficiency for the contaminants being removed from the contaminated vadose zone by the SVE system.

County Attainment Status

Pollutant	Status
PM10	attainment
SO2	attainment
NO2	attainment
Ozone	attainment
CO	attainment
Lead	attainment

Part 70 Permit Determination

The landfill SVE/RTO facility is not subject to the Part 70 Permit requirements because it will take a voluntary limit on emissions of HCl of 10 tons per year. At this emission rate the total HAPs emission rate will be approximately 13 tons per year (includes the HCl) A Part 70 permit is not required because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than one hundred (100) tons per year;
- (b) a single hazardous air pollutant (HAP) is less than ten (10) tons per year, and;
- (c) any combination of HAPs is less than twenty-five (25) tons per year.

State and Federal Rule Applicability

The proposed facility is subject to the requirements of WAC 173-400-110, New Source Review (NSR), and WAC 173-455-120, NSR Fees.

1.1. WAC 173-400-113, Requirements for new sources in attainment or unclassifiable areas, is the State regulation that defines the evaluations of the air quality project at this landfill. The subsections of WAC 173-400-113 require the following:

1.1.1. WAC 173-400-113(1): "The proposed new source will comply with all applicable new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAP)...".

1.1.1.1. Ecology is not aware of any NSPS or NESHAP that apply to the Pasco Landfill SVE operations.

1.1.2. WAC 173-400-113(2): "The proposed new source or modification will employ BACT for all pollutants not previously emitted or whose emissions would increase as a result of the new source or modification".

1.1.2.1. Pasco Landfill proposes that the RTO, resulting in 98% control of the VOC removed from the vadose zone by the SVE system, and its exhaust containing a maximum of 0.7 pounds per hour VOC represents BACT and t-BACT. Ecology agrees although we note that there is no economic analyses provided supporting this determination. The control proposed requires that the active oxidation bed in the RTO be maintained at a temperature at or higher than 1600 degrees Fahrenheit, and that the flow of SVE gas and dilution air are accurately and precisely monitored.

1.1.3. WAC 173-400-113(5): "If the proposed new source or the proposed modification will emit any toxic air pollutants regulated under chapter 173-460 WAC, the source meets all applicable requirements of that program. The RTO will reduce and emit several pollutants regulated under WAC 173-460. Because this project is being done under an agreed clean up order under MTCA, normal air quality program jurisdiction does not apply. However, Ecology's Toxic Cleanup Program does not have the toxicology or air pollution engineering expertise required for this project so AQ and TCP agreed that AQ would process the RTO application in accordance with AQ NSR rules.

1.2. WAC 173-460, Controls for New Sources of Toxic Air Pollutants, is the State regulation that addresses the risk to the public from routine releases of toxic air contaminants from new and modified sources.

- 1.2.1. WAC 173-460-050: The applicant must quantify the facility's emissions of toxic air contaminants. The applicant has done this in its application. The toxics emission point will be the exhaust stack of the RTO.
- 1.2.2. WAC 173-460-060: The applicant must install and operate t-BACT on each emission point for which there is an increase in a toxic air pollutant. The Approval Order based on the analyses described in this technical support document contains emission limitations that reflect t-BACT for a hazardous waste clean-up project like this one.
- 1.2.3. WAC 173-460-070: This section of the regulation requires that impacts of emissions of toxic air pollutants be demonstrated to be sufficiently low to protect human health and safety. This was accomplished by modeling the dispersion of any TAP emitted at a rate greater than the WAC 173-460 small quantity emission rates to determine the concentration of that pollutant at the property boundary. The RTO while reducing the halogenated organics in the SVE stream, produces acid gases as a result. HF and HCl are the two acid gases of greatest concern and HCl will be emitted at a rate sufficient to exceed the acceptable source impact level (ASIL) at the property boundary. This impact triggers a Health Impact Assessment (HIA), referred to as a Tier II toxics review, to determine if the impacts can be approved at concentrations determined to be higher than the ASIL. The applicant provided a HIA to the Ecology modelers and toxicologists for this Tier II review. The toxicologists have provided the Tier II recommendation in Appendix B to this technical support document. As part of the Tier I review, Ecology questioned whether dioxins might also be formed by this control device. After review of documents referenced by the applicant, Ecology found no evidence that dioxins are a concern great enough to establish permit limits or require emission testing. The important features of this control device that support that determination are the requirement that the unit be maintained at 1600 degrees Fahrenheit and the fact that the heat recovery bed quenches the exhaust stream to below dioxin-favorable temperatures almost immediately. The unit will emit very low levels of particulate matter to serve as necessary nucleation sites for the formation process.
- 1.2.4. There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) applicable to this source.

Conclusion

Ecology has determined the applicant, PBS Engineering and Environmental, has satisfied all of the requirements of New Source Review for its proposal to establish an air pollution control device on the soil vapor extraction system at the Pasco Landfill MTCA clean up site. The construction and operation of this pollution control device (the RTO) shall be subject to the conditions of the attached proposed Approval Order no. 16AQ-E031.

Previous RTO Technical Support Information

The following is the technical support document for the 2014 GCE RTO. Supporting documentation remains substantially the same for the new unit as all operational parameters of the new RTO are the same or will result in slightly lower receptor impacts during RTO operations.

Approval Order No.: 14AQ-E571
Permit Engineer: Robert Koster

Introduction

The Washington State Clean Air Act and its supporting regulation, the General Regulation for Air Pollution Sources requires all new or modified sources of air pollution to submit notice before constructing and operating any new source of air pollution except single family and duplex dwellings or de minimis sources. This process is referred to as NSR. NSR includes a verification that the new or modified source will not cause or contribute to a violation of any ambient air quality standard, employ Best Available Control Technology (BACT), and comply with all federal and state rules. After the analysis, an order of approval is issued that sets forth requirements and conditions to ensure those requirements are met.

History

On August 18, 2014, the Industrial Waste Area Generators Group (IWAG) responsible for the clean-up of Zone A (the 40,000 drum hazardous waste deposit at the Pasco Sanitary Landfill) submitted a Notice of Construction (NOC) application for the rerouting of Zone A gas from the flare combusting both municipal waste generated gas and the Zone A gas to a regenerative thermal oxidizer (RTO) dedicated to the Zone A soil vapor extraction (SVE) system. The SVE system is currently operated as part of an interim compliance strategy for the IWAG to prevent the spread of subsurface contaminants from Zone A under Agreed Order No. 9240. Historically the Ecology Air Quality Program did not require NOC approval for a Model Toxics Control ACT (MTCA) project such as this. In late 2013 it was determined that this could jeopardize Ecology's ability to implement federal air quality permitting requirements in Washington. As per guidance on the application of the permit exemption for MTCA projects, Ecology's air quality program agreed to issue approval for criteria pollutant emissions from this SVE/RTO project. Following that agreement, it was determined that the toxic air contaminant health impact evaluation would be most efficiently performed by Ecology's AQP toxicologists and that the determinations resulting should be incorporated into the criteria air pollutant approval.

Permitted Emission Units and Pollution Control Equipment

The AQP has not issued a permit for the Zone A clean up. It was the program's historic belief that the MCTA permit exemption applied and that AQP interests were served by TCP implementing substantive and mandatory AQ requirements. So, rather than issuing separate AQ approval, the AQP assisted the Toxics Clean-up Program (TCP) to implement necessary AQ requirements. In accordance with Ecology guidance issued in late 2013, the AQP will now issue an approval for this RTO project. The approval will include any specific air toxics limitations as an efficient way to use the AQ toxicology and modeling expertise.

Unpermitted Emission Units and Pollution Control Equipment

There are no unpermitted facilities operated by this source during this review process.

New Emission Units and Pollution Control Equipment

The proposed RTO will replace the use of the flare to dispose of the gases drawn from the area (Zone A) with drums of hazardous waste. The RTO is designed to combust 1000 scfm of the contaminated soil vapor extracted from Zone A with 1300 scfm of dilution air. In addition, seven gallons per hour of condensate will be introduced to the RTO for disposal. The application indicates that the overall VOC destruction and removal efficiency will be greater than 98%.

The source consists of the following new facility/unit:

- (a) One two-canister RTO, Gulf Coast Environmental (GCE) Model 20-92-RTO,

Existing Approval Orders

None

Stack Summary

There is one stack for the RTO which has been evaluated for this project. In the past, the SVE gases were cofired in the flare that combusted gases generated in the municipal solid waste part of the landfill. The municipal solid waste gases will be isolated from the SVE gases and will continue to be combusted in the flare.

Enforcement Issue(s)

There are no air quality enforcement actions pending for this source.

Recommendation

Staff recommends that the construction and operation of the RTO facility be approved. This recommendation is based on the following facts and conditions:

Information used in this review was derived from the revised application and Second Tier Health Impact Assessment (received October 24, 2014).

A complete application for the purposes of this review was received on October 24, 2014.

Emission Calculations

See appendix A for emission estimates.

Actual Emissions

No previous emission data has been received by the air quality program from the source.

Limited Potential to Emit

The source shall limit total VOC emissions to a maximum of 3.3 lb/hr at the outlet of the RTO. The source must also demonstrate and continue to demonstrate that the RTO will result in a 98% destruction/removal efficiency for the contaminants being removed from the contaminated vadose zone by the SVE system.

County Attainment Status

Pollutant	Status
PM10	attainment
SO2	attainment
NO2	attainment
Ozone	attainment
CO	attainment
Lead	attainment

Part 70 Permit Determination

The landfill SVE facility is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than one hundred (100) tons per year;
- (b) a single hazardous air pollutant (HAP) is less than ten (10) tons per year, and;
- (c) any combination of HAPs is less than twenty-five (25) tons per year.

State and Federal Rule Applicability

The proposed facility is subject to the requirements of WAC 173-400-110, New Source Review (NSR), and WAC 173-455-120, NSR Fees.

- 1.3. WAC 173-400-113, Requirements for new sources in attainment or unclassifiable areas, is the State regulation that defines the evaluations of the air quality project at this landfill. The subsections of WAC 173-400-113 require the following:
 - 1.3.1. WAC 173-400-113(1): "The proposed new source will comply with all applicable new source performance standards (NSPS), national emission standards for hazardous air pollutants (NESHAP)..."

- 1.3.1.1. Ecology is not aware of any NSPS or NESHAP that apply to the Pasco Landfill operations.
- 1.3.2. WAC 173-400-113(2): "The proposed new source or modification will employ BACT for all pollutants not previously emitted or whose emissions would increase as a result of the new source or modification".
 - 1.3.2.1. Pasco Landfill proposes that the RTO, resulting in 98% control of the VOC removed from the vadose zone by the SVE system, and its exhaust containing a maximum of 3.3 pounds per hour VOC represents BACT and t-BACT. Ecology agrees although we note that there is no economic analyses provided supporting this determination. The control proposed requires that the active oxidation bed in the RTO be maintained at a temperature at or higher than 1600 degrees Fahrenheit, and that the flow of SVE gas and condensate and dilution air are accurately and precisely monitored.
- 1.3.3. WAC 173-400-113(5): "If the proposed new source or the proposed modification will emit any toxic air pollutants regulated under chapter 173-460 WAC, the source meets all applicable requirements of that program. The RTO will reduce and emit several pollutants regulated under WAC 173-460. Because this project is being done under an agreed clean up order under MTCA, normal air quality program jurisdiction does not apply. However, Ecology's Toxic Cleanup Program does not have the toxicology or air pollution engineering expertise required for this project so AQ and TCP agreed that AQ would process the RTO application in accordance with AQ NSR rules.
- 1.4. WAC 173-460, Controls for New Sources of Toxic Air Pollutants, is the State regulation that addresses the risk to the public from routine releases of toxic air contaminants from new and modified sources.
 - 1.4.1. WAC 173-460-050: The applicant must quantify the facility's emissions of toxic air contaminants. The applicant has done this in its application. The toxics emission point will be the exhaust stack of the RTO.
 - 1.4.2. WAC 173-460-060: The applicant must install and operate t-BACT on each emission point for which there is an increase in a toxic air pollutant. The Approval Order based on the analyses described in this technical support document contains emission limitations that reflect t-BACT for a hazardous waste clean-up project like this one.
 - 1.4.3. WAC 173-460-070: This section of the regulation requires that impacts of emissions of toxic air pollutants be demonstrated to be sufficiently low to protect human health and safety. This was accomplished by modeling the dispersion of any TAP emitted at a rate greater than the WAC 173-460 small quantity emission rates to determine the concentration of that pollutant at the property boundary. The RTO while reducing the halogenated organics in the SVE stream, produces acid gases as a result. HF and HCl are the two acid gases of greatest concern and HCl will be emitted at a rate sufficient to exceed the acceptable source impact level (ASIL) at the property boundary. This impact triggers a Health Impact Assessment (HIA), referred to as a Tier II toxics review, to determine if the impacts can be

approved at concentrations determined to be higher than the ASIL. The applicant provided a HIA to the Ecology modelers and toxicologists for this Tier II review. The toxicologists have provided the Tier II recommendation in Appendix B to this technical support document. As part of the Tier I review, Ecology questioned whether dioxins might also be formed by this control device. After review of documents referenced by the applicant, Ecology found no evidence that dioxins are a concern great enough to establish permit limits or require emission testing. The important features of this control device that support that determination are the requirement that the unit be maintained at 1600 degrees Fahrenheit and the fact that the heat recovery bed quenches the exhaust stream to below dioxin-favorable temperatures almost immediately. The unit will emit very low levels of particulate matter to serve as necessary nucleation sites for the formation process.

- 1.4.4. There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs) applicable to this source.

Conclusion

Ecology has determined the applicant, Environmental Partners, Inc., has satisfied all of the requirements of New Source Review for its proposal to establish an air pollution control device on the soil vapor extraction system at the Pasco Landfill MTCA clean up site. The construction and operation of this pollution control device (the RTO) shall be subject to the conditions of the attached proposed Approval Order no. 14AQ-E571.