Technical Support Document for
NOC Approval Order No. 14AQ-C191 First Revision
Dirt Hugger
Dallesport, WA

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1.0 Project Summary

Dirt Hugger (herein refered to as 'the Permittee') is an existing compost facility in Dallesport. The facility is classified as a 'synthetic minor 80% source' with multiple emissions units and activities, both new and existing. This review was for: a facility expansion; an increase in permitted feedstock throughput (short and long term); approval of recent changes in compost process operations; and the permitting of four nonroad engines as stationary sources.

2.0 Application Processing

2.1 Timeliness

Application Received (date)	Initial Completeness Determination (date)	# of days from App Received to Initial Completeness Determination (target = 30)	Complete Application Received (date)	Draft Permit Proposed (date)	# of days from Complete Application to Draft Permit (target = 60)	Public Comment Period closed (date)	Date Final Decision issued	# of days from complete application received to final decision issued (target = 60)	Start to finish total days from application in to final decision out
10/24/16	11/21/16	28	7/18/19	8/5/19	18	9/4/19	9/17/19	n/a	1,058

2.2 Public Notice

Receipt of the application was posted on Ecology's Public Involvement Calendar from 10/18/16 through 11/2/16. Public notice was required because the applicant submitted a petition for second-tier review under WAC 173-460-090. The public comment period was held from 8/5/19 through 9/4/19; however, no comments were received.

2.3 Applicant Review

A draft of the order was sent to the Permittee on 5/9/19 for factual review. Comments were received from the Permittee on 5/15/19 via email, and on 5/21/19 in person. An updated modeling report was submitted on 5/31/19 to demonstrate compliance with for the requested changes to the order. Additional data was also submitted on 6/12/19, 7/15/19, and 7/18/19 to complete the application.

2.4 Fees

The fee for this action was originally considered to be $1,500 ('basic project') + $95/hr (after 16 hrs)[1]. Ecology received payment of $875 on 10/21/16; the remainder of the base

[1] Since the project ended up requiring second-tier review, the correct categorization for the action was 'complex project', which results in a $10,000 base fee. However, the categorization was not changed, as the hourly fee assures our time-investment is recovered within the final fee.

fee has been shifted to the final fee (the Permittee was informed about this on 5/10/19, via email).

The second-tier review fees for this action were billed under first-tier review (no separate $10,000 initial fee and hourly $95 charge after 106 hours), as approved by Kathy Taylor during March 2019. Staff in this office and headquarters spent a combined 248.0 hours on this permit action. An additional fee of $22,665 was invoiced on 9/9/19. Payment was received by 9/17/19 (no date was provided in fiscal email).

2.5 SEPA

A SEPA mitigated determination of non-significance (MDNS) was issued by the Klickitat County Health Department on 1/11/18 for the expansion.

3.0 Applicable Regulations

3.1 State Regulations

3.1.1 New Source Review Applicability

The unrestricted potential to emit (PTE) of the project exceeded the Table 110(5) exemption levels listed under WAC 173-400-110 for carbon monoxide (CO), nitrogen oxides (NO_X), particulate matter ($PM_{2.5}$ and PM_{10}), and VOC emissions. Therefore, the project was subject to new source review per WAC 173-400-110(2).

The unrestricted PTE of the project exceeded the de minimis emission values listed under WAC 173-460-150 for eleven toxic air pollutants (TAPs), as listed under Appendix A. Therefore, the project was subject to new source review per WAC 173-400-110(2) and WAC 173-460-040(1).

3.1.2 General Standards for Maximum Emissions

WAC 173-400-040(2) generally limits visible emissions from all sources to no more than three minutes of 20 percent opacity, in any one hour, of an air contaminant from any emissions unit. The standard applies to each of the compost processes (including stockpiling) and all four of the stationary-source diesel engines.

Condition 4.3.3 of the order restricts stationary engine emissions to 5% opacity. Meanwhile, Condition 4.3.4 states that visible emissions from both the stationary engines and composting processes are not allowed (0% opacity) at the property boundary.

3.1.3 Emission Standards for Combustion and Incineration Units

WAC 173-400-050(1) limits emissions of PM from combustion units to 0.10 grains per dry standard cubic foot (dscf) of exhaust gas. This standard applies to each of the four stationary engines. There was not sufficient emissions data submitted for the engines to evaluate particulate emissions in these units. However, I assume the emission units can comply with the standard, based on another recent project[1]. If the engines cannot comply with Condition 4.3.3, the likelihood for compliance with this standard should be reevaluated.

WAC 173-400-050(2) limits emissions of total carbonyls from incinerators; the standard does not apply to this project, since there are no such proposed units.

3.1.4 Emission Standards for General Process Units

WAC 173-400-060 limits general process units to 0.10 grain/dscf of exhaust gas. Composting meets the WAC 173-400-030 definition of a general process unit, since it involves a combination of procedures for the purpose of causing a change in material by either chemical or physical means. Meanwhile, the definition excludes combustion from procedures which would trigger such categorization. Therefore, the standard applies only to composting. However, the standard was not included in the order, as compost emissions are unlikely to contain significant ammounts of particulate matter.

3.1.5 Emission Standards for Sources Emitting Hazardous Air Pollutants

No area source rules applicable to this source category are adopted by reference at WAC 173-400-075(6)(c)(i).

3.1.6 Standards of Performance for New Sources

By way of the adoption-by-reference specified at WAC 173-400-115(1)(a), Title 40 Code of Federal Regulations (CFR) Part 60 Subpart IIII applies to each of the stationary-source engines, as the regulation existed on January 24, 2018. The rule was last revised on July 7, 2016; therefore, requirements of the state-adopted version are equivalent to the current federal version (discussed below).

3.2 Federal Regulations

3.2.1 National Emission Standards for Hazardous Air Pollutants for Source Categories

Title 40 CFR Part 63 Subpart ZZZZ (a.k.a. the 'RICE NESHAP') applies to each of the stationary-source engines. Condition 1 of the Order requires compliance with this regulation. However, each engine is also subject to the ICE NSPS (see below). Title 40 CFR §63.6590(c) specifies that the engines shall meet the

[1] NOC Approval Order No. 19AQ-C234 for Sabey Data Center Properties; see corresponding TSD for the observations which lead to this assumption.

requirements of the NESHAP by meeting the requirements of NSPS; therefore, no further requirements apply to the engines.

3.2.2 Standards of Performance for New Stationary Sources

Title 40 CFR Part 60 Subpart IIII (a.k.a. the 'ICE NSPS') applies to each of the stationary-source engines. Condition 1 of the Order requires general compliance with Subpart IIII. The non-administrative requirements of the regulation are:

- Emission standards for the engines. These standards are the basis of the limits specified under Condition 4.3.3.
- A requirement to only use diesel fuel with a maximum sulfur content of 15 ppm (i.e. ultra-low sulfur diesel). This requirement is included as Condition 4.2.5.
- Monitoring requiremnts for diesel particulate filters, where equipped. These requirements are listed under Conditions 6.6.1-6.6.2.

4.0 Emissions

4.1 Emission Factors

For composting, I identified San Joaquin Valley Air Pollution Control District's (SJVAPCD) 2010 'Compost VOC Emission Factors' report as containing the best available baseline VOC emission factor. The study presented the results of many compost source tests; the VOC emission factor was based on four of those tests. Three of the referenced source tests also contained data on NH_3 emissions; therefore, I averaged that data to form an NH_3 emission factor. I found that two of the four tests listed in the SJVAPCD report also had sufficient data to calalculate stockpile VOC and NH_3 emission factors.

Ecology then consulted with numerous air agencies, both within and outside of the state, as well as two compost-industry source testing experts regarding selected emission factors. This was an effort of multiple staff at Ecology from three different offices. Those discussions reinforced the use of the SJVAPCD-based emission factors as the best available data. Alternate emission factors were presented by the Permittee; however, those factors were not utilized[1]. PM emissions from composting were not calculated, due to the size distribution and moisture content of the feedstock and compst (less likely to blow away).

For control efficicies of compost pile emissions, one of the four tests listed in the SJVAPCD report presented data on the distribution of emissions during the compost processes. This information was utilized in the modeling of emissions from the facility. The referenced report also presented a VOC destruction efficiency related to application

[1] For detail concerning why the emission factors were rejected, see the "response to comments questions and requests.pdf" attachment in my 6/4/19 email to Pierce Louis.

of a finished compost layer (pseudo biofilter) to piles. Finally, I also found sufficient data in the report to calalculate an NH_3 destruction efficiency related to pseudo-biofilter application. These destruction efficiencies were applied to this project for traditional biofilter control, as I was unable to find acceptable alternative data.

The consultants could not identify emission factors specific to the stationary engines. Therefore, the applicable emission standarts listed under 40 CFR Part 60 Subpart IIII were largely utilized for the CO, NO_X, PM, and VOC engine emissions (the VOC emission factor for the shredder was calculated by the consultant per Table 3.3-1 of AP-42 Chapter 3.3). The emission factors for SO_2 were calculated on a mass-balance basis, based on the sulfur content of ultra-low-sulfur diesel and the average heating value of diesel fuel. Generic stationary diesel-engine emissions factors for 19 TAP were taken from EPA's AP-42 Compilation of Air Pollutant Emission Factors, 5th Edition, Volume 1, Chapter 3.3, Table 3.3-2.

4.2 Best Available Control Technology | Best Available Control Technology for Toxics

The Permittee proposed use of positive aeration, frequent turning, and good operational practices as BACT/tBACT in their permit application. However, I think the starting point for BACT for this sector is enclosure of tipping activities, finished compost application to newly formed beds, minimized pile turning, and negative aeration of active emissions with traditional biofilter control. In any case a formal BACT analysis was not performed.

The Permittee proposed negative aeration and biofilter control to reduce emissions under Title V the applicability threshold for VOC. The Permittee also agreed to apply an unscreened finished compost cover to newly formed portions of the compost bed. I accepted the emissions reductions corresponding to these practices as likely meeting or exceeding BACT for VOC and tBACT for NH_3. For this exisiting facility, discussions with the Permittee and other air jurisdictions indicated that enclosure may be cost prohibitive due to physical property constraints.

For the stationary engines, the consultant verified that each unit was manufactured according to the emissions standards specified by 40 CFR Part §60.4204. Ecology's permit engineer accepted uncontrolled emissions from the engines as likely meeting or exceeded tBACT for benzene, carbon monoxide, diesel particulate matter (DPM), naphthalene, and nitrogen dioxide.

4.3 Additional Voluntary Emission Controls

The Permittee proposed application of finished compost to the stockpile to help reduce site-wide VOC emissions below the Title V applicability threshold.

5.0 Ambient Air Quality Standards

5.1 Criteria Pollutants

Dispersion modeling to demonstrate compliance with the National Ambient Air Quality (NAAQS) was not conducted for this project because VOC is not a criteria air pollutant. While, under the right conditions, VOC is a precursor for ozone and secondary $PM_{2.5}$ (criteria pollutants), this source's VOC emissions are not expected to contribute to NAAQS exceedances.

Modeling was required for CO, NO_X, $PM_{2.5}$, and PM_{10} as those criteria pollutants are emitted above their respective criteria pollutant WAC 173-400-110 Table 110(5) exemption levels.

5.1.1 Modeling for CO and NO_X

The modeling conducted by the consultant demonstrated that estimated concentrations of will remain below the cause or contribute threshold values listed under Table 4a of WAC 173-400-113.

5.1.2 Modeling for $PM_{2.5}$ and PM_{10}

Due to an error in calculations, the consultant did not realize modeling was needed for particulate. Therefore, I used the modeling performed for DPM to estimate $PM_{2.5}$ and PM_{10} concentrations, starting with the maximum modeled DPM annual concentration and the highest 24-hour DPM concentration. Since we direct that the PM emissions include hydrocarbons (they are assumed to condense and contribute to PM), the modeled concentration for each engine was independently scaled using the PM and VOC emission factors (NSPS emission standards for PM and hydrocarbons).

My analysis showed that maximum annual $PM_{2.5}$, 24-hour PM_{10}, and annual PM_{10} emissions are not likely to exceed the cause or contribute values listed under Table 4a of WAC 173-400-113. Therefore, NAAQS demonstrations for PM_{10} emissions and annual $PM_{2.5}$ emissions aren't required per WAC 173-400-113(3).

The maximum 24-hour PM_{10} emissions were over the Table 4a cause or contribute value. However, when I combined the calculated value with the background[1] value for the Dallesport area, the result was below the 24-hour $PM_{2.5}$ NAAQS. Therefore, the emissions are not expected to contribute to a violation of that NAAQS.

[1] The background value was retrieved from the 'Background Concentrations 2014 - 2017' tool (https://arcg.is/1jXmHH) for Dallesport, accessed 7/19/19.

5.2 Toxic Air Pollutants

As limited by the Order, emissions of 1,3-butadiene, acetaldehyde, acrolein, CO (as a TAP), dibenz[a,h]anthracene, formaldehyde, and naphthalene are below the small quantity emission rate (SQER) listed for each TAP under WAC 173-460-150. Therefore, modeling for those pollutants was not required.

Modeling was required for diesel particulate matter, NH_3, and NO_2, as those TAPs are emitted above their respective SQER values. The modeling demonstrated estimated concentrations of benzene and 1-hour NO_2 were below the acceptable source impact level (ASIL) concentrations listed for each TAP under WAC 173-460-150. The Permittee submitted a petition for second-tier review under WAC 173-460-090 for NH_3 and diesel particulate matter, as those emissions were modeled above their ASIL.

Ecology determined that the NH_3 and diesel particulate matter health risk in the area near the Permittee will not likely result in excessive risk or cause short- or long- term health effects. These findings are documented in the health impact analysis associated with the second-tier review petition.

Appendix A – TAPs that Triggered Minor New Source Review

The table below lists the toxic air pollutants evaluated as part of this project; those emitted above the de minimis emission values listed under WAC 173-460-150 triggered review. The PTE for the four stationary engines and composting activities was calculated without operational limits and emissions control.

CAS No.	Pollutant	De Minimis Exceeded?
106-99-0	1,3-butadiene	yes
75-07-0	acetaldehyde	yes
107-02-8	acrolein	yes
7664-41-7	ammonia	yes
56-55-3	benz[a]anthracene	-
71-43-2	benzene	yes
50-32-8	benzo[a]pyrene	-
205-99-2	benzo[b]fluoranthene	-
207-08-9	benzo[k]fluoranthene	-
218-01-9	chrysene	-
630-08-0	CO	yes
53-70-3	dibenz[a,h]anthracene	yes
-	diesel engine exhaust, particulate	yes
50-00-0	formaldehyde	yes
193-39-5	indeno[1,2,3-cd]pyrene	-
108-38-3	m-xylene	-
91-20-3	naphthalene	yes
10102-44-0	nitrogen dioxide	yes
95-47-6	o-xylene	-
115-07-1	propylene	-
106-42-3	p-xylene	-
7446-09-5	sulfur dioxide	-
108-88-3	toluene	-