



Public Utility District No. 1 of Klickitat County

January 29, 2019

Washington Department of Ecology
Cashiering Unit
P.O. Box 47611
Olympia, WA 98504-7611

Attn: Lynnette Haller
Ecology Central Regional Office – Air Quality Program

Subject: Modification of NOC Permit for a Renewable Natural Gas Production Facility at the
H.W. Hill Landfill Gas Power Plant

Dear Ms. Haller:

This letter requests a modification of Notice of Construction (NOC) Order No. 08AQ-C080, Fourth Revision for the Public Utility District No. 1 of Klickitat County (KPUD) Renewable Natural Gas (RNG) Plant at the H.W. Hill Landfill Gas Power Plant located in Klickitat County, Washington.

KPUD has constructed and is currently operating its RNG Plant that converts landfill gas to RNG using a combination of processes including a “Selexol” process which utilizes a solvent mixture for carbon dioxide removal. The RNG is injected into a nearby natural gas pipeline and sold to customers connected to the pipeline for use as a transportation fuel.

During initial commissioning of the RNG Plant which began in September 2018, there were frequent startups and shutdowns of the plant as the new equipment was tested and adjusted prior to achieving commercial production. Startup of the RNG Plant requires several hours of venting to the Candlestick Flare. The Candlestick Flare is limited to 500 hr/yr of operation pursuant to Condition 5.4 of NOC Order No. 08AQ-C080, Fourth Revision. These frequent plant startups during the commissioning process have caused the RNG Plant to approach, but not exceed, this 500 hours per year flare operating limit. We note that the flare is only operated for startup and emergency purposes, and that typical flare venting rates are far below the flare design capacity.

The Candlestick Flare is described in the NOC Order as a “252 MMBtu/hr (5,000 scfm) candlestick flare for startup and emergency gas venting.” All toxics and criteria pollutant emissions associated with flare operation are based on a 5,000 scfm gas flow rate and 500 hours per year of operation. We have included as attachments to this letter the emissions spreadsheets for the Candlestick Flare from the original RNG Plant NOC application submitted to Ecology in June 2017.

KPUD is proposing to change its annual hourly limit to an equivalent flare gas flow limit in order to allow more operational flexibility during periods of frequent startups such as plant commissioning. 500 hours per year and 5,000 scfm is equivalent to 150 million standard cubic feet per year (MMscf/yr) of vent gas to the flare:

$$500 \text{ hr/yr} \times 5,000 \text{ scf/min} \times 60 \text{ min/hr} \times \text{MMscf} / 10^6 \text{ scf} = 150 \text{ MMscf/yr}$$

KPUD is proposing the following language to implement this change to Condition 5.4:

5.4 *Candlestick flare ~~operation~~ gas flow shall not exceed ~~500 hr/yr~~ 150 MMscf/yr. The flare shall be operated for startup and emergency purposes only; any extended RNG plant outages will result in the gas being redirected to either the Power Plant and/or Roosevelt Regional Landfill's existing enclosed flare(s).*

No other permit changes are required, since emission rates from the flare will not change.

KPUD has a flow meter in the flare vent pipeline, and this flow meter is connected to the plant data acquisition system. KPUD will use this flare gas flow meter to verify compliance with the 150 MMscf/yr venting limit. We note that data from this flare gas flow meter indicate that actual flows to the flare are much less than 5,000 scfm during plant startup venting events.

With this letter we are also requesting a change to the facility Air Operating Permit (AOP) No. 18AQ-C221. However, the NOC change and the AOP change should not be integrated. That is, we request that the NOC change be issued as soon as possible, with the AOP change to follow after the required noticing periods. This letter includes a certification statement and is signed by a KPUD responsible official.

We have enclosed a check for \$200 for a simple change to an existing permit pursuant to Ecology form ECY-070-410, along with a completed form ECY-070-410. If you have any questions please call me at (509) 773-7430, or call our air quality consultant for this project, Jeffrey Adkins of Sierra Research at (916) 273-5127.

I certify that I am the responsible official, as defined in WAC 173-401-200(27) for this facility. I further certify as required by WAC 173-401-520, which, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate, and complete.

Sincerely,

Kevin Ricks
KPUD Renewable Energy Assets Manager
Designated Responsible Official for the H.W. Hill Landfill Gas Power Plant

Attachments: NOC Application Emission Calculations, Form ECY-070-410
Check for \$200 payable to Washington DOE

cc: Jeffrey Adkins, Trinity Consultants



Notice of Construction Application

A notice of construction permit is required before installing a new source of air pollution or modifying an existing source of air pollution. This application applies to facilities in Ecology’s jurisdiction. Submit this application for review of your project. For general information about completing the application, refer to Ecology Forms ECY 070-410a-g, “Instructions for Ecology’s Notice of Construction Application.”

Ecology offers up to 2 hours of free pre-application help. We encourage you to schedule a pre-application meeting with the contact person specified for the location of your proposal (see below). For more help than the initial 2 free hours, submit Part 1 of the application and the application fee. You may schedule a meeting with us at any point in the process.

Completing the application, enclose it with a check for the initial fee and mail to:

**WA Department of Ecology
Cashiering Unit
P.O. Box 47611
Olympia, WA 98504-7611**

For Fiscal Office Use Only:
001-NSR-216-0299-000404

Check the box for the location of your proposal. For help, call the contact listed below.		
	Ecology Permitting Office	Contact
<input checked="" type="checkbox"/> CRO	Chelan, Douglas, Kittitas, Klickitat, or Okanogan County Ecology Central Regional Office – Air Quality Program	Lynnette Haller (509) 457-7126 lynnette.haller@ecy.wa.gov
<input type="checkbox"/> ERO	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Stevens, Walla Walla, or Whitman County Ecology Eastern Regional Office – Air Quality Program	Jolaine Johnson (509) 329-3452 jolaine.johnson@ecy.wa.gov
<input type="checkbox"/> NWRO	San Juan County Ecology Northwest Regional Office – Air Quality Program	Dave Adler (425) 649-7267 david.adler@ecy.wa.gov
<input type="checkbox"/> IND	Kraft and Sulfite Paper Mills and Aluminum Smelters Ecology Industrial Section – Waste 2 Resources Program Permit manager: _____	James DeMay (360) 407-6868 james.demay@ecy.wa.gov
<input type="checkbox"/> NWP	U.S. Department of Energy Hanford Reservation Ecology Nuclear Waste Program	Phil Gent (509) 372-7983 phil.gent@ecy.wa.gov

To request ADA accommodation, call (360) 407-6800, 711 (relay service), or 877-833-6341 (TTY).



Notice of Construction Application

Check the box for the fee that applies to your application.

New project or equipment

<input type="checkbox"/>	\$1,500: Basic project initial fee covers up to 16 hours of review
<input type="checkbox"/>	\$10,000: Complex project initial fee covers up to 106 hours of review

Change to an existing permit or equipment

<input checked="" type="checkbox"/>	\$200: Administrative or simple change initial fee covers up to 3 hours of review Ecology may determine your change is complex during completeness review of your application. If your project is complex, you must pay the additional \$675 before we will continue working on your application.
<input type="checkbox"/>	\$875: Complex change initial fee covers up to 10 hours of review
<input type="checkbox"/>	\$350 flat fee: Replace or alter control technology equipment (WAC 173-400-114) Ecology will contact you if we determine your change belongs in another fee category. You must pay the fee associated with that category before we will continue working on your application.

Read each statement, then check the box next to it to acknowledge that you agree.

<input checked="" type="checkbox"/>	The initial fee you submitted may not cover the cost of processing your application. Ecology will track the number of hours spent on your project. If the number of hours Ecology spends exceeds the hours included in your initial fee, Ecology will charge you \$95 per hour for the extra time.
<input checked="" type="checkbox"/>	You must include all information in this application. Ecology may not process your application if it does not include all the information requested.
<input checked="" type="checkbox"/>	Submittal of this application allows Ecology staff to inspect your facility.



Notice of Construction Application

Part 1: General Information

I. Project, Facility, and Company Information

1. Project Name Permit condition change for KPUD Renewable Natural Gas Production Facility	
2. Facility Name H.W. Hill Landfill Gas Power Plant	
3. Facility Street Address 502 Roosevelt Grade Road, Roosevelt WA 99356	
4. Facility Legal Description Northeast quarter of Section 27, Township 4 North, Range 21 East, Willamette Meridian, approximately five miles North of Roosevelt in Klickitat County.	
5. Company Legal Name (if different than Facility Name) Public Utility District No. 1 of Klickitat County	
6. Company Mailing Address (street, city, state, zip) 1313 S Columbus, Goldendale WA 98620	

II. Contact Information and Certification

1. Facility Contact Name (who will be on-site) Kevin Ricks	
2. Facility Contact Mailing Address (if different than Company Mailing Address)	
3. Facility Contact Phone Number 509.773.7430	4. Facility Contact Email KRicks@klickpud.com
5. Billing Contact Name (who should receive billing information) Kevin Ricks	
6. Billing Contact Mailing Address (if different than Company Mailing Address)	
7. Billing Contact Phone Number 509.773.7430	8. Billing Contact Email KRicks@klickpud.com
9. Consultant Name (optional – if 3rd party hired to complete application) Jeffrey Adkins	
10. Consultant Organization/Company Trinity Consultants	
11. Consultant Mailing Address (street, city, state, zip) 3301 C Street, Suite 400, Sacramento, CA 95816	
12. Consultant Phone Number 916.273.5127	13. Consultant Email jadkins@trinityconsultants.com
14. Responsible Official Name and Title (person responsible for project policy or decision-making) Kevin Ricks	
15. Responsible Official Mailing Address 1313 S Columbus, Goldendale WA 98620	
16. Responsible Official Phone 509.773.7430	17. Responsible Official Email KRicks@klickpud.com
18. Responsible Official Certification and Signature I certify that the information on this application is accurate and complete.	
Signature _____ Date <u>1/29/2019</u>	



Notice of Construction Application Part 2: Technical Information

The Technical Information may be sent with this application to the Ecology Cashiering Unit, or may be sent directly to the appropriate Ecology office along with a copy of this application.

For all sections, check the box next to each item as you complete it.

III. Project Description

Attach the following to your application:

- Description of your proposed project
- Projected construction start and completion dates
- Operating schedule and production rates
- List of all major process equipment with manufacturer and maximum rated capacity
- Process flow diagram with all emission points identified
- Plan view site map
- Manufacturer specification sheets for major process equipment components
- Manufacturer specification sheets for pollution control equipment
- Fuel specifications, including type, consumption (per hour and per year), and percent sulfur

IV. State Environmental Policy Act (SEPA) Compliance

Check the appropriate box below.

- SEPA review is complete.
Include a copy of the final SEPA checklist and SEPA determination (e.g., DNS, MDNS, EIS) with your application.
- SEPA review has not been conducted.
 - If SEPA review will be conducted by another agency, list the agency. You must provide a copy of the final SEPA checklist and SEPA determination before Ecology will issue your permit.
Agency Reviewing SEPA:

 - If SEPA review will be conducted by Ecology, fill out a SEPA checklist and submit it with your application. You can find a SEPA checklist online at <http://www.ecy.wa.gov/programs/sea/sepa/forms.htm>.



Notice of Construction Application

V. Emissions Estimations of Criteria Pollutants

Does your project generate air pollutant emissions? Yes No

If yes, provide the following information about your air pollutant emissions:

- Air pollutants emitted, such as carbon monoxide (CO₂), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), and volatile organic compounds (VOC), particulate matter (PM_{2.5}, PM₁₀, TSP), sulfur dioxide (SO₂)
- Potential emissions of criteria air pollutants in tons per hour, tons per day, and tons per year (include calculations)
- Fugitive air pollutant emissions – pollutant and quantity

VI. Emissions Estimations of Toxic Air Pollutants

Does your project generate toxic air pollutant emissions? Yes No

If yes, provide the following information about your toxic air pollutant emissions:

- Toxic air pollutants emitted (specified in [WAC 173-460-150¹](#))
- Potential emissions of toxic air pollutants in pounds per hour, pounds per day, and pounds per year (include calculations)
- Fugitive toxic air pollutant emissions - pollutant and quantity

VII. Emission Standard Compliance

Does your project comply with all applicable standards identified? Yes No

- Provide a list of all applicable new source performance standards, national emission standards for hazardous air pollutants, national emission standards for hazardous air pollutants for source categories, and emission standards adopted under the Washington Clean Air Act, Chapter 70.94 RCW.

VIII. Best Available Control Technology

- Provide a complete evaluation of Best Available Control Technology (BACT) for your proposal.

¹ <http://apps.leg.wa.gov/WAC/default.aspx?cite=173-460-150>



Notice of Construction Application

IX. Ambient Air Impacts Analyses

Does your project cause or contribute to a violation of any ambient air quality standard or acceptable source impact level? Yes No

Provide the following:

- Ambient air impacts analyses for criteria air pollutants (including fugitive emissions)
- Ambient air impacts analyses for toxic air pollutants (including fugitive emissions)
- Discharge point data for each point included in ambient air impacts analyses (include only if modeling is required)
 - Exhaust height
 - Exhaust inside dimensions (diameter or length and width)
 - Exhaust gas velocity or volumetric flow rate
 - Exhaust gas exit temperature
 - Volumetric flow rate
 - Discharge description (i.e., vertically or horizontally) and if there are any obstructions (e.g., raincap)
 - Emission unit(s) discharging from the point
 - Distance from the stack to the nearest property line
 - Emission unit building height, width, and length
 - Height of tallest building on-site or in the vicinity, and the nearest distance of that building to the exhaust
 - Facility location (urban or rural)

Table 6 (revised)
Maximum Emissions from the
Emergency Flare

Pollutant	Factor (lb/MMBtu)	lb/hr ¹	lb/day	lb/yr ²	ton/yr
NOx	0.068	17.1	411	8,559	4.3
CO	0.31	78.0	1,873	39,020	19.5
VOC	0.008	2.1	50	1,050	0.5
SOx	0.014	3.5	85	1,762	0.9
PM ₁₀ /PM _{2.5}	0.015	3.7	90	1,868	0.9

Note:

1 Hourly emissions based on 252 MMBtu/hr firing rate.

2 Annual emissions based on 500 hours/year operation

Utility Flare					
	Factor	Units	MMBtu/hr	hr/yr	MT CO _{2e} /yr
GHG	52.34	kg CO _{2e} /MMBtu	252	500	6,588

Utility Flare	
5,000	scfm landfill gas
83.0%	CH4 (vol)
17%	CO2 (vol)
1,011	Btu/scf CH4
252	MMBtu/hr
4,150	scfm CH4
0.25	MMscf/hr CH4
379.60	scf/mol
16	lb/mol CH4
10,495	lb/hr CH4
1%	VOC (assumed)
105	lb/hr VOC
500	Operating hr/yr

AP42 Section 2.4

LFG Flare	Vendor Spec lb/MMBtu	2008 draft lb/MMdscf CH4	1998 lb/MMdscf CH4
VOC	98%	97.7%	99.2%
NO2	0.068	39	40
CO	0.31	46	750
PM*	0.015	15	17

*PM emission factor based on AP-42 2008 draft

VOC factor	2.1	lb/hr VOC
	0.008	lb/MMBtu

SOx factor*	0.014	lb/MMBtu
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*SOx factor from turbine permit

Emergency Flare Toxic Emissions

Toxic Compound	MW	ppmv	lb/hr	lb/day	lb/year
1,1,1-Trichloroethane	133.42	0	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethane	98.95	0	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	96.94	0	0.00E+00	0.00E+00	0.00E+00
1,1,2,2-Tetrachloroethane	167.85	0	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloro-1,1,2,2-tetrafluoroethane	170.92	0	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	98.96	0.25	3.91E-04	9.39E-03	1.96E-01
1,2-Dichloropropane	112.98	0	0.00E+00	0.00E+00	0.00E+00
1,2,4-Trimethylbenzene	120.19	0.51	9.69E-04	2.33E-02	4.84E-01
1,3,5-Trimethylbenzene	120.19	0.29	5.51E-04	1.32E-02	2.75E-01
1,3-Butadiene	54.09	0	0.00E+00	0.00E+00	0.00E+00
2-Butanone (MEK)	72.11	27	3.08E-02	7.39E-01	1.54E+01
2-Propanol	60.11	35	3.33E-02	7.98E-01	1.66E+01
4-Ethyltoluene	120.195	0.28	5.32E-04	1.28E-02	2.66E-01
4-Methyl-2-Pentanone (MIBK)	100.16	2.1	3.32E-03	7.98E-02	1.66E+00
Acetone	58.08	25	2.30E-02	5.51E-01	1.15E+01
Acrylonitrile	53.06	0	0.00E+00	0.00E+00	0.00E+00
alpha-Pinene	136.24	7.8	1.68E-02	4.03E-01	8.40E+00
Benzene	78.11	2.2	2.72E-03	6.52E-02	1.36E+00
Bromodichloromethane	163.83	0	0.00E+00	0.00E+00	0.00E+00
c-1,2-Dichloroethene	96.94	0.47	7.20E-04	1.73E-02	3.60E-01
Carbon disulfide	76.13	0	0.00E+00	0.00E+00	0.00E+00
Carbon tetrachloride	153.84	0	0.00E+00	0.00E+00	0.00E+00
Chlorobenzene	112.56	0	0.00E+00	0.00E+00	0.00E+00
Chloroethane	64.52	0	0.00E+00	0.00E+00	0.00E+00
Chloroform	119.39	0	0.00E+00	0.00E+00	0.00E+00
Chloromethane	50.49	0	0.00E+00	0.00E+00	0.00E+00
Cumene	120.2	0.35	6.65E-04	1.60E-02	3.32E-01
Cyclohexane	84.16	1.4	1.86E-03	4.47E-02	9.31E-01
Dichlorodifluoromethane	120.91	0.46	8.79E-04	2.11E-02	4.40E-01
d-Limonene	136.24	3	6.46E-03	1.55E-01	3.23E+00
Ethanol	46.08	100	7.28E-02	1.75E+00	3.64E+01
Ethyl Acetate	88.11	4.1	5.71E-03	1.37E-01	2.85E+00
Ethylbenzene	106.16	5.5	9.23E-03	2.21E-01	4.61E+00
Dichlorobenzene	147	0	0.00E+00	0.00E+00	0.00E+00
Hydrogen sulfide	34.08	0.01	5.39E-06	1.29E-04	2.69E-03
Methylene chloride (Dichloromethane)	84.94	0.25	3.36E-04	8.06E-03	1.68E-01
n-Butyl Acetate	116.16	0.69	1.27E-03	3.04E-02	6.33E-01
n-Heptane	100.21	2.6	4.12E-03	9.88E-02	2.06E+00
n-Hexane	86.18	1.4	1.91E-03	4.58E-02	9.54E-01
n-Nonane	128.26	3	6.08E-03	1.46E-01	3.04E+00
n-Octane	114.23	1.6	2.89E-03	6.93E-02	1.44E+00
n-Propylbenzene	120.195	0.24	4.56E-04	1.09E-02	2.28E-01
Propene	42.08	12	7.98E-03	1.92E-01	3.99E+00
Styrene	104.15	0.31	5.10E-04	1.22E-02	2.55E-01
Tetrachloroethene (Perchloroethylene)	165.83	0.29	7.60E-04	1.82E-02	3.80E-01
t-1,2-Dichloroethene	96.94	0	0.00E+00	0.00E+00	0.00E+00
Tetrahydrofuran	72.11	7	7.98E-03	1.91E-01	3.99E+00
Toluene	92.13	18	2.62E-02	6.29E-01	1.31E+01
Trichloroethylene	131.38	0.16	3.32E-04	7.97E-03	1.66E-01
Trichlorofluoromethane	137.38	0	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	62.5	0.19	1.88E-04	4.50E-03	9.38E-02
Vinyl Acetate	86.09	0	0.00E+00	0.00E+00	0.00E+00
Xylenes	106.16	12.6	2.11E-02	5.07E-01	1.06E+01

Emission Calculation Assumptions: 5,000 scfm Flare flow rate

60 F

379.6 scf/mol

98.0% Vendor control efficiency

500 hr/yr

Toxic factors from KPUD Gas Treatment Inlet Data