



Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

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DEPARTMENT OF ECOLOGY
NWP - RICHLAND

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13-ESQ-0011

APR 04 2013

Mr. E. R. Skinnarland
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton Boulevard
Richland, Washington 99354

Dear Mr. Skinnarland:

TRANSMITTAL OF REQUEST TO INCREASE REPORTING THRESHOLDS FOR 200 WEST LAGOON TREATMENT SYSTEM

For your review and approval, this letter transmits the attached application to increase the reporting threshold for ammonia, chloroform, and 1,4-dichlorobenzene listed in Table 2 of Approval Order DE12NWP-001 for the 200 West Lagoon Treatment System. The enclosed application provides calculations and modeling results to show that the proposed thresholds are more practical indicators of compliance with the acceptable source impact level for each pollutant. The proposed reporting thresholds would eliminate unnecessary notification of sampling results and compliance validation by the Hanford Site as well as unnecessary review and approval by the State of Washington, Department of Ecology.

If you have any questions, please contact me, or your staff may contact Clifford E. Clark, Acting Director, Environmental, Safety, and Quality Division, on (509) 376-9333.

Sincerely,

Ray J. Corey, Assistant Manager
for Safety and Environment

ESQ:DEJ

Enclosure

cc w/encl:

R. H. Anderson, MSA
T. G. Beam, MSA
S. L. Camp, MSA
L. L. Fritz, MSA
P. M. Gent, Ecology
M. Kamberg, MSA
M. C. Ramos, MSA

J. E. Rasmussen, YAHS GS
A. F. Shattuck, MSA
S. D. Shupe, MSA
M. B. Skorska, Ecology
R. A. Westberg, MSA
M. B. Wilson, MSA
Environmental Portal, LMSI

ENCLOSURE

**REQUEST TO INCREASE REPORTING THRESHOLDS FOR
200 WEST LAGOON TREATMENT SYSTEM**

Consisting of 15 pages,
including this cover page



Notice of Construction Application

This application applies statewide for facilities under the Department of Ecology's jurisdiction. Submit this form for review of your project to construct a new or modified source of air emissions. Please refer to Ecology Forms ECY 070-410a-g, "Instructions for NOC Application," for general information about completing the application.

Ecology offers up to two hours of free pre-application assistance. We encourage you to schedule a pre-application meeting with the contact person specified for the location of your proposal, below. If you use up your two hours of free pre-application assistance, we will continue to assist you after you submit Part 1 of the application and the application fee. You may schedule a meeting with us at any point in the process.

Upon completion of the application, please enclose a check for the initial fee and mail to:

**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 assistance, call the contact listed below:		
	Ecology Permitting Office	Contact
<input type="checkbox"/>	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"/>	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Stevens, Walla Walla or Whitman County Ecology Eastern Regional Office – Air Quality Program	Greg Flibbert (509) 329-3452 gregory.flibbert@ecy.wa.gov
<input type="checkbox"/>	San Juan County Ecology Northwest Regional Office – Air Quality Program	David Adler (425) 649-7082 david.adler@ecy.wa.gov
<input type="checkbox"/>	For actions taken at Kraft and Sulfite Paper Mills and Aluminum Smelters Ecology Industrial Section – Waste 2 Resources Program Permit manager: _____	Garin Schriever (360) 407-6916 garin.schriever@ecy.wa.gov
<input checked="" type="checkbox"/>	For actions taken on the US Department of Energy Hanford Reservation Ecology Nuclear Waste Program	Philip Gent (509) 372-7983 philip.gent@ecy.wa.gov



Notice of Construction Application

Check the box below 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 under 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 bill you \$95 per hour for the extra time.
<input checked="" type="checkbox"/>	You must include all information requested by 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 visit and inspect your facility.



Notice of Construction Application

Part 1: General Information

I. Project, Facility, and Company Information

1. Project Name Request to increase ammonia, chloroform, and 1,4-dichlorobenzene reporting thresholds for 200 West Lagoon Treatment System (Approval Order No. DE12NWP-001)
2. Facility Name 200W Area Lagoon Treatment System (Hanford Nuclear Reservation)
3. Facility Street Address Section 31, T 13N, Range 26EWM, Lat: 46 34' 12.12"N Long: 119 36' 34.86" W
4. Facility Legal Description N/A
5. Company Legal Name (if different from Facility Name) U.S. Department of Energy, Richland Operations Office (DOE-RL)
6. Company Mailing Address (street, city, state, zip) P.O. Box 550 Richland, WA 99352

II. Contact Information and Certification

1. Facility Contact Name (who will be onsite) Thomas G. Beam	
2. Facility Contact Mailing Address (if different than Company Mailing Address) P.O. Box 650 MSIN H7-28 Richland, WA 99352	
3. Facility Contact Phone Number (509) 376-4876	4. Facility Contact E-mail
5. Billing Contact Name (who should receive billing information) Dale E. Jackson	
6. Billing Contact Mailing Address (if different than Company Mailing Address)	
7. Billing Contact Phone Number (509) 376-8086	8. Billing Contact E-mail dale.jackson@rl.doe.gov
9. Consultant Name (optional – if 3 rd party hired to complete application elements)	
10. Consultant Organization/Company	
11. Consultant Mailing Address (street, city, state, zip)	
12. Consultant Phone Number	13. Consultant E-mail
14. Responsible Official Name and Title (who is responsible for project policy or decision-making) Dale E. Jackson, DOE-RL Air Programs Manager	
16. Responsible Official Phone (509) 376-8086	17. Responsible Official E-mail dale.jackson@rl.doe.gov
18. Responsible Official Certification and Signature I certify, based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete. Signature Date 3-27-13	



Notice of Construction Application

Part 2: Technical Information

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

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

III. Project Description

See Section 1 (Project Description) in the Supplemental Information.

Please attach the following to your application.

- Written narrative describing 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 & 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.

Note: A SEPA checklist for the LTS was provided to Ecology on December 6, 2011 (letter number 12-EMD-0017).

- SEPA review has not been conducted:
 - If 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 the 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 www.ecy.wa.gov/programs/sea/sepa/docs/echecklist.doc



Notice of Construction Application

V. Emissions Estimations of Criteria Pollutants

Does your project generate criteria air pollutant emissions? Yes No

If yes, please provide the following information regarding your criteria emissions in your application.

The names of the criteria air pollutants emitted (i.e., NO_x, SO₂, CO, PM_{2.5}, PM₁₀, TSP, VOC, and Pb)

Potential emissions of criteria air pollutants in tons per hour, tons per day, and tons per year (include calculations)

If there will be any fugitive criteria pollutant emissions, clearly identify the pollutant and quantity

Note: The proposed project does not cause an increase in emissions of criteria pollutants.

VI. Emissions Estimations of Toxic Air Pollutants

Does your project generate toxic air pollutant emissions? Yes No

If yes, please provide the following information regarding your toxic air pollutant emissions in your application.

The names of the 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)

If there will be any fugitive toxic air pollutant emissions, clearly identify the pollutant and quantity

Note: See Section 2 (Change in Maximum Emissions) in the Supplemental Information.

VII. Emission Standard Compliance

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 Chapter 70.94 RCW.

Note: A review of NSPS and NESHAPS requirements was provided to Ecology on December 15, 2011 (letter number 12-EMD-0020). An update to the NSPS/NESHAPS review is not applicable to the permit revision request.

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



Notice of Construction Application

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

VIII. Best Available Control Technology

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

Note: Analysis of BACT was provided to Ecology on December 15, 2011 (letter number 12-EMD-0020). An update to the BACT analysis is not applicable to the permit revision request.

IX. Ambient Air Impacts Analyses

Please 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 air impacts analyses (include only if modeling is required)
 - Exhaust height
 - Exhaust inside dimensions (ex. diameter or length and width)
 - Exhaust gas velocity or volumetric flow rate
 - Exhaust gas exit temperature
 - The volumetric flow rate
 - Description of the discharges (i.e., vertically or horizontally) and whether there are any obstructions (ex., raincap)
 - Identification of the emission unit(s) discharging from the point
 - The 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
 - Whether the facility is in an urban or rural location

Note: See Section 3 (Ambient Air Impact Analysis) in the Supplemental Information.

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

SUPPLEMENTAL INFORMATION

**Request to Increase Reporting Thresholds for
200 West Lagoon Treatment System**

1. Project Description

The enclosed application requests the increase of reporting thresholds for ammonia, chloroform, and 1,4-dichlorobenzene listed in Table 2 of Approval Order No. DE12NWP-001 for the 200 West Lagoon Treatment System (LTS). Table 1 presents existing and proposed reporting thresholds.

Table 1: Existing and Proposed Reporting Thresholds

Pollutant	Existing Threshold	Proposed Threshold
Ammonia	60 mg/L	52,400 mg/L (52.4 g/L)
Chloroform	50 µg/L	12,400,000 µg/L (12.4 g/L)
1,4-Dichlorobenzene	135 µg/L	2,650,000 µg/L (2.65 g/L)

The reporting thresholds serve as indicators of compliance with the acceptable source impact level (ASIL) for ammonia, chloroform, and 1,4-dichlorobenzene (as listed in 1.2.1 of Approval Order No. DE12NWP-001). Recent sampling results exceeded the existing 60 mg/L ammonia reporting threshold. However, based on additional analysis, it was determined that compliance with the ASIL for ammonia was maintained.¹ Therefore, the Hanford Site is requesting to adjust the ammonia reporting threshold to a more practical indicator of ammonia emissions compliance. To maintain consistency, the Hanford Site is also requesting to adjust the reporting threshold for chloroform and 1,4-dichlorobenzene. The proposed reporting thresholds would eliminate unnecessary notification of sampling results and compliance validation by the Hanford Site as well as unnecessary review and approval by the State of Washington, Department of Ecology. The proposed thresholds do not contradict or cause a violation with any of the reporting requirements or limits in the State Waste Discharge Permit (No. ST0045514) for the LTS.

The proposed reporting thresholds represent the maximum concentrations that can be reached without exceeding the ASIL for each pollutant. Maximum emissions from the LTS were estimated using the U.S. Environmental Protection Agency WATER9 Wastewater Treatment Model and the proposed thresholds. Air dispersion modeling using AERMOD was performed to verify compliance with the ASIL. For each pollutant, the highest modeled concentration at the nearest public access location was less than 99 percent of the respective ASIL.

2. Change in Maximum Emissions

The WATER9 Wastewater Treatment Model (version 3.0) was used to estimate maximum emissions from the LTS using the proposed thresholds for ammonia, chloroform, and 1,4-dichlorobenzene. Tables 2, 3, and 4 summarize the WATER9 modeling results.

¹ A notification of the sampling results and compliance validation was submitted to Ecology on February 8, 2013 (letter number 13-EMD-0021).

Table 2: Summary of WATER9 Modeling Results for Ammonia

Emissions Point	Max. Ammonia Emissions (based on 52.4 g/L concentration)		
	(g/s)	(lb/hr)	(Tons/yr)
<i>Primary Waste Stream</i>			
Grit Chamber	6.59E+00	5.23E+01	2.29E+02
Grinder	5.04E-01	4.00E+00	1.75E+01
Aerated Lagoon 1	1.02E+01	8.10E+01	3.55E+02
Aerated Lagoon 2	1.02E+01	8.10E+01	3.55E+02
Settling Lagoon 1	2.95E+00	2.34E+01	1.03E+02
Settling Lagoon 2	2.97E+00	2.36E+01	1.03E+02
Evaporative Lagoon 1	4.66E+00	3.70E+01	1.62E+02
Evaporative Lagoon 2	4.61E+00	3.66E+01	1.60E+02
<i>Secondary Waste Stream</i>			
Grinder	6.38E-07	5.06E-06	2.22E-05
Lime Stabilization Unit	2.50E-17	1.98E-16	8.69E-16
Polymer Mixing Unit	2.50E-17	1.98E-16	8.69E-16
Total	42.68	338.77	1,483.79

Table 3: Summary of WATER9 Modeling Results for Chloroform

Emissions Point	Max. Chloroform Emissions (based on 12.4 g/L concentration)		
	(g/s)	(lb/hr)	(Tons/yr)
<i>Primary Waste Stream</i>			
Grit Chamber	3.14E-01	2.49E+00	1.09E+01
Grinder	1.08E+00	8.57E+00	3.75E+01
Aerated Lagoon 1	7.73E-01	6.13E+00	2.69E+01
Aerated Lagoon 2	6.98E-01	5.54E+00	2.43E+01
Settling Lagoon 1	2.32E-04	1.84E-03	8.06E-03
Settling Lagoon 2	2.58E-04	2.05E-03	8.97E-03
Evaporative Lagoon 1	3.54E-04	2.81E-03	1.23E-02
Evaporative Lagoon 2	1.14E-04	9.05E-04	3.96E-03
<i>Secondary Waste Stream</i>			
Grinder	1.27E-25	1.01E-24	4.41E-24
Lime Stabilization Unit	2.58E-40	2.05E-39	8.97E-39
Polymer Mixing Unit	2.58E-40	2.05E-39	8.97E-39
Total	2.87	22.75	99.63

Table 4: Summary of WATER9 Modeling Results for 1,4-Dichlorobenzene

Emissions Point	Max. 1,4-Dichlorobenzene Emissions (based on 2.65 g/L concentration)		
	(g/s)	(lb/hr)	(Tons/yr)
<i>Primary Waste Stream</i>			
Grit Chamber	2.44E-01	1.94E+00	8.48E+00
Grinder	1.43E+00	1.13E+01	4.97E+01
Aerated Lagoon 1	2.80E+00	2.22E+01	9.73E+01
Aerated Lagoon 2	1.44E+00	1.14E+01	5.01E+01
Settling Lagoon 1	2.12E-04	1.68E-03	7.37E-03
Settling Lagoon 2	4.28E-04	3.40E-03	1.49E-02
Evaporative Lagoon 1	8.82E-03	7.00E-02	3.07E-01
Evaporative Lagoon 2	1.75E-03	1.39E-02	6.08E-02
<i>Secondary Waste Stream</i>			
Grinder	4.74E-26	3.76E-25	1.65E-24
Lime Stabilization Unit	1.94E-40	1.54E-39	6.74E-39
Polymer Mixing Unit	1.94E-40	1.54E-39	6.74E-39
Total	5.93	47.03	205.97

Note: The same WATER9 modeling setup and assumptions described in the initial Notice of Construction application for the LTS were used (letter number 12-EMS-0020, provided to Ecology on December 15, 2011).

Calculations used:

$$\text{Maximum Hourly Emission Rate} \left(\frac{\text{lb}}{\text{hr}} \right) = \text{EmissionRate} \left(\frac{\text{g}}{\text{s}} \right) \times \left(\frac{1\text{lb}}{453.595\text{g}} \right) \times \left(\frac{60\text{s}}{1\text{min}} \right) \times \left(\frac{60\text{min}}{1\text{hr}} \right)$$

$$\text{Maximum Annual Emission Rate} \left(\frac{\text{T}}{\text{yr}} \right) = \text{Emission Rate} \left(\frac{\text{lb}}{\text{hr}} \right) \times \left(\frac{24\text{hr}}{\text{day}} \right) \times \left(\frac{365\text{days}}{\text{yr}} \right) \times \left(\frac{1\text{T}}{2,000\text{lbs}} \right)$$

3. Ambient Air Impact Analysis

a. AERMOD Modeling Setup

Model Selection: AERMOD (version 12060)

Source Parameters:

Source Type	Polygon Area
Release Height	0 m
Initial Vertical Dimension	0 m
Area	122,204.5 m ²
Elevation	0 m
Ammonia Emission Rate	3.49E-04 g/m ² s (based on 42.68 g/s)

Chloroform Emission Rate	2.35E-05 g/m ² s (based on 2.87 g/s)
1,4-Dichlorobenzene Emission Rate	4.85E-05 g/m ² s (based on 5.93 g/s)

Receptors: Flagpole receptors, 1.8 meters high (breathing zone), were used. Boundary receptors were placed 100 meters apart along public access areas (i.e. Columbia River, Yakima Barricade, Rattlesnake Barricade, Highway 240, and the Wye Barricade). A grid of receptors that were spaced every 1 km and encompassed an area 31 km long and 33 km wide was used.

Meteorology: Hanford Meteorological Station surface and profile met data for 2001 through 2005, and Spokane Station 4106 upper air met data for 2001 through 2005.

Terrain: Elevations of buildings, emission sources, and receptors were calculated using AERMAP and U.S. Geological Survey 10-meter resolution National Elevation Dataset data files. Default rural dispersion was used.

Building Downwash: Building downwash effects were not applicable.

b. AERMOD Modeling Results

The highest modeled 24-hour ammonia concentration was 69.8 µg/m³, which was located along Highway 240 (see Figure 1). The highest modeled annual chloroform concentration was 0.0430 µg/m³, which was located along Route 2S (see Figure 2). The highest modeled annual 1,4-dichlorobenzene concentration was 0.0887 µg/m³, which was located along Route 2S (see Figure 3).

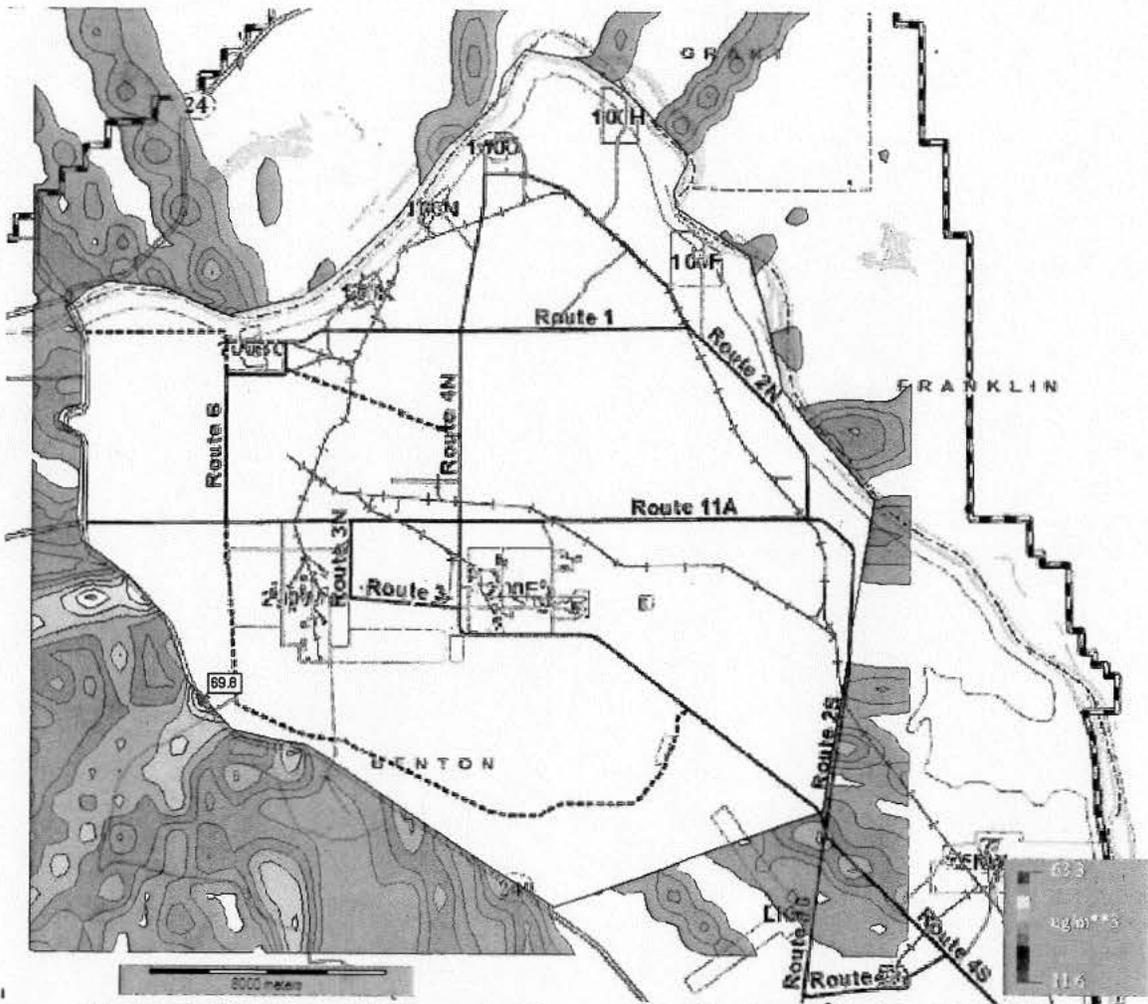


Figure 1: Maximum 24-hr ammonia concentration ($\mu\text{g}/\text{m}^3$) using AERMOD

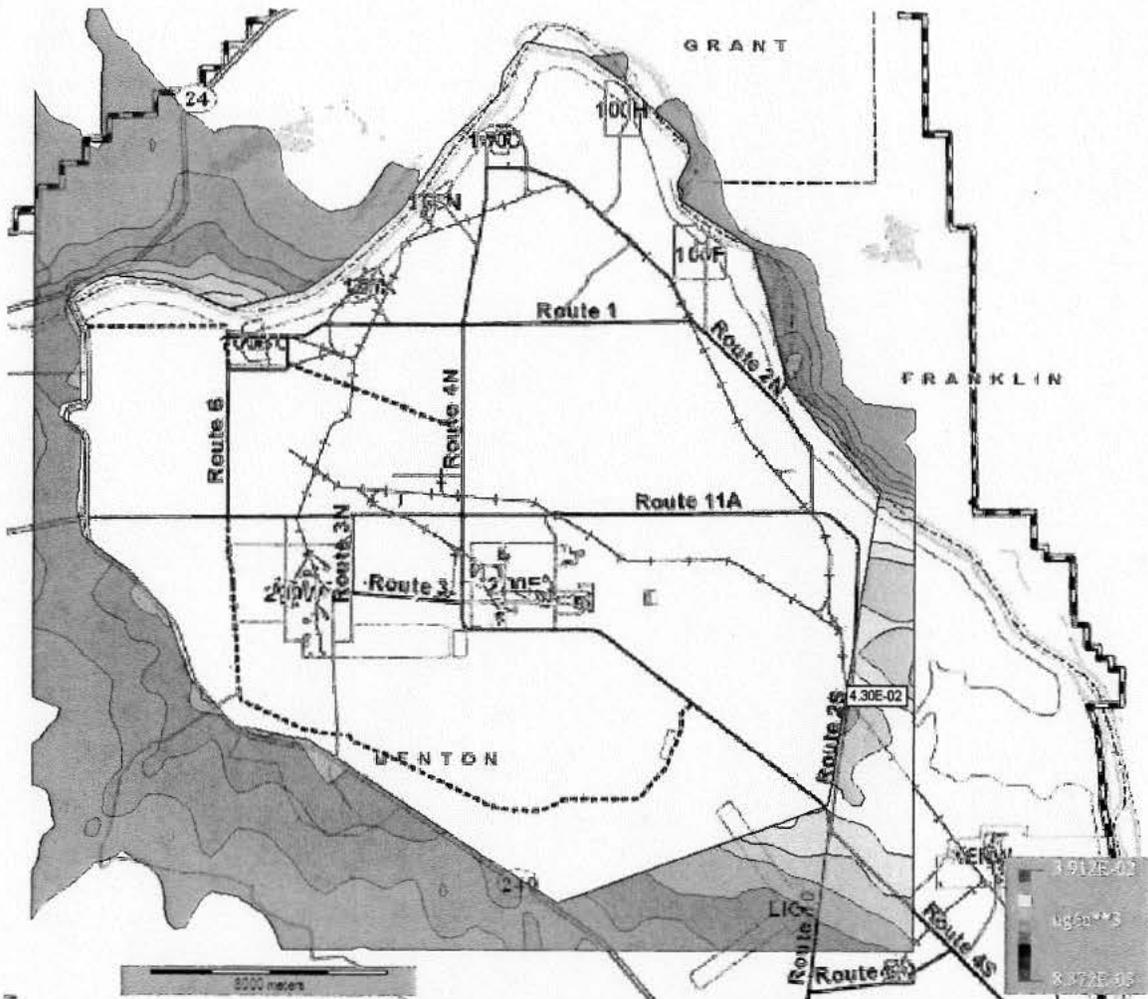


Figure 2: Maximum annual chloroform concentration ($\mu\text{g}/\text{m}^3$) using AERMOD

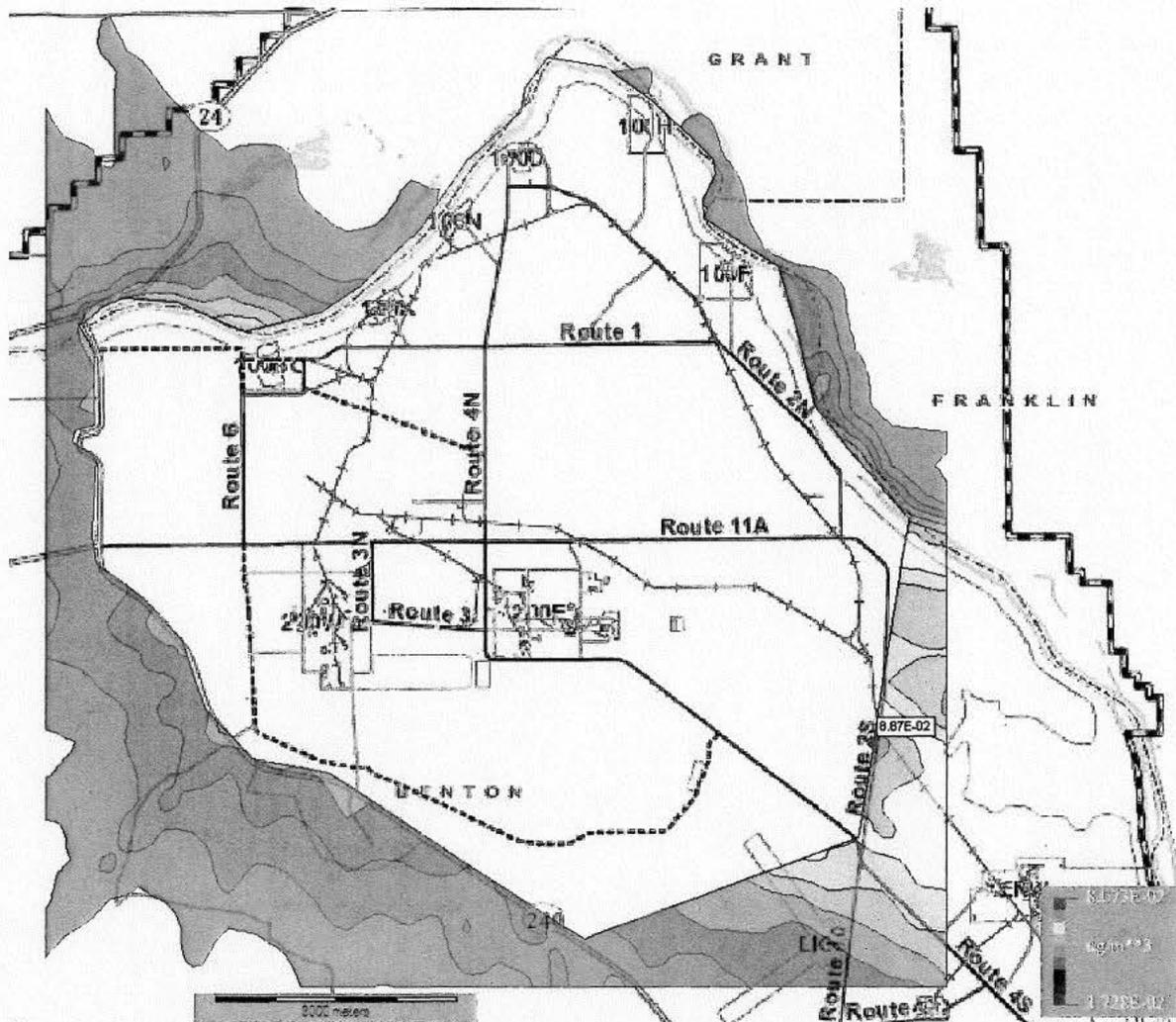


Figure 3: Maximum annual 1,4-dichlorobenzene concentration ($\mu\text{g}/\text{m}^3$) using AERMOD

Table 5 provides a comparison of the AERMOD modeling results and the ASIL. Based on the AERMOD modeling results, compliance with approval condition 1.2.1 (Emission Limits) of Approval Order No. DE12NWP-001 for ammonia, chloroform, and 1,4-dichlorobenzene would be maintained.

Table 5: Comparison of AERMOD Modeled Emissions to ASIL

Pollutant	Averaging Period	Acceptable Source Impact Level (ASIL) ($\mu\text{g}/\text{m}^3$)	Maximum Concentration per Averaging Period ($\mu\text{g}/\text{m}^3$)	Percent of ASIL
Ammonia	24-hr	70.8	69.8	98.6 %
Chloroform	year	0.0435	0.0430	98.9 %
1,4-Dichlorobenzene	year	0.0909	0.0887	97.6 %

SQER
(10/100)
9.31
8.35
17.4