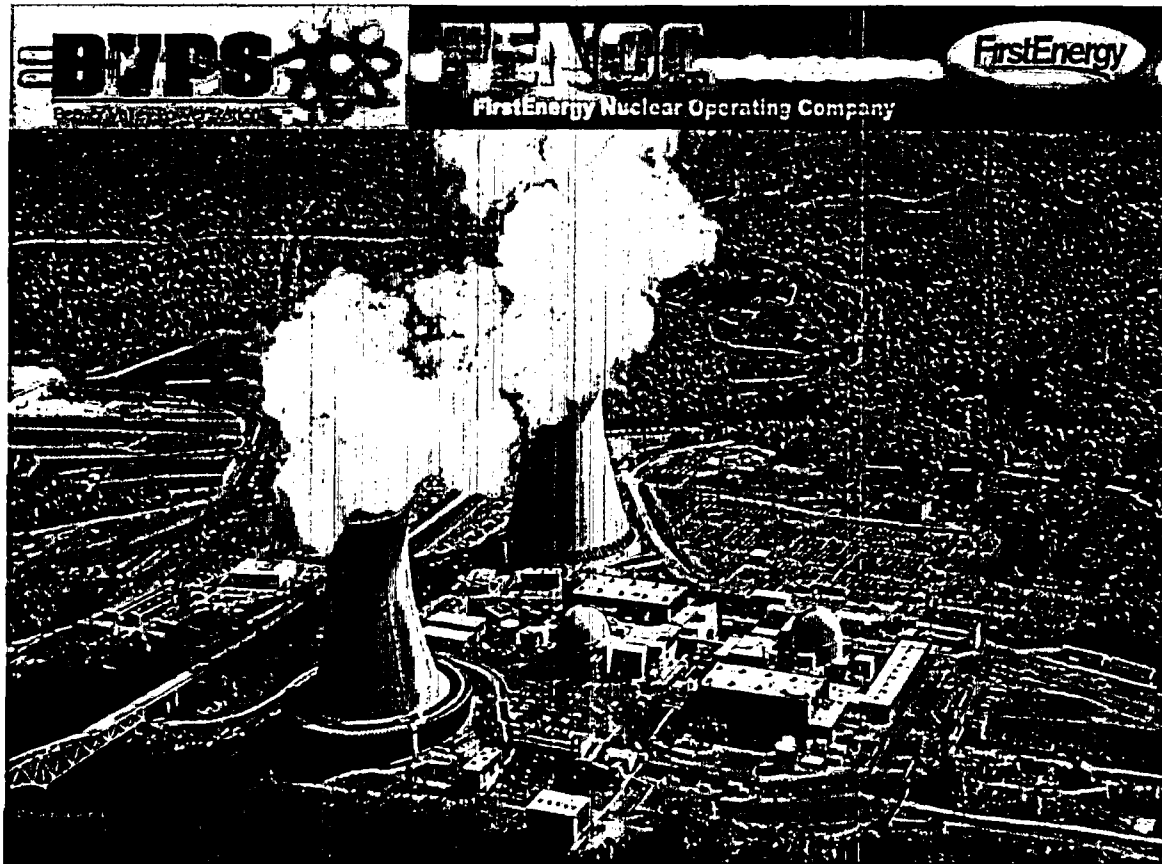


**FirstEnergy Nuclear Operating Company
(FENOC)**

Beaver Valley Power Station



Renewal Application for NPDES Permit No. PA0025615

June 2006

L-06-109
June 26, 2006

Ms. Kareen Milcic, Permits Chief
Water Management Program
Southwest Region
Pennsylvania Department of Environmental Protection
400 Waterfront Drive
Pittsburgh, PA 15222-4745

Renewal Application for Beaver Valley Power Station
NPDES Permit No. PA0025615

Dear Ms. Milcic:

Enclosed please find three copies of the Pennsylvania Department of Environmental Protection (DEP) NPDES Permit renewal application for First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station. Included with each are copies of the letters and certified mail receipts providing notice to the Borough of Shippingport and Beaver County that the amended NPDES permit application is being submitted. A check for \$500.00 for payment of the application fee is enclosed.

As an aid to the process, we have enclosed an additional letter intended as a preliminary list of issues for discussion. Included are several issues we have discussed with the Department over the past several years.

FENOC looks forward to discussing this package with you in detail. For more information, please contact Mr. Michael Banko at 724-682-4117.

Sincerely,



Richard G. Mende
Director, Site Operations

Enclosures

cc: Document Control Desk, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001
(Reference Docket Number 50-412)

C001

NPD3NRE: 0374
June 27, 2006

Ms. Kareen Milcic, Permits Chief
Water Management Program
Southwest Region
Department of Environmental Protection
400 Waterfront Drive
Pittsburgh, PA 15222-4745

RE: Preliminary Issues Regarding the Renewal of NPDES Permit No. PA0025615 for
FirstEnergy Nuclear Operating Company's Beaver Valley Power Station
Shippingport Borough, Beaver County, Pennsylvania

Dear Ms. Milcic:

FirstEnergy Nuclear Operating Company ("FENOC") is submitting this preliminary list of issues in conjunction with its renewal application for NPDES Permit No. PA0025615 ("Permit") for the Beaver Valley Power Station ("BVPS" or "Station"), located in Shippingport Borough, Beaver County, Pennsylvania. This letter is divided into two parts. The first part presents recommended, universal changes to be made throughout the Permit, while the second part identifies additional revisions pertaining to specific outfalls or Permit conditions.

A. Requested Changes to be Incorporated Throughout the Permit

1. Biocide Issues: In order to avoid potential confusion, the following changes should be made regarding biocide applications:
 - a. Limitations on biocide applications referring to "when discharging" should be clarified to reflect that such limitations apply only "when performing macrofouler treatment" referred to in Subpart A of the proposed revised Condition C.15, discussed below. They should not apply during the microbiological control treatments referred to in Subpart B of the proposed revised Condition C.15.
 - b. All references to "Clamtrol CT-1" should be changed to "biocide."
 - c. All references to "Betz DT-1" should be changed to "bentonite-based detoxicant."

2. As indicated by the charts attached hereto as "Appendix A," the sampling results for several outfalls consistently have been well below the applicable limits for over the past five years. As such, the current monitoring frequency is not justified, and the frequency of monitoring should be reduced at the following outfalls for the identified parameters:

Outfall	Parameters	Requested Action
001	Chromium Zinc	Reduce to 1/year Reduce to 1/year
010	Free Available Chlorine Total Residual Chlorine ("TRC")	Reduce to 1/month Reduce to 1/month
013	Copper Chlorobenzene Total Cyanide	Delete limitations Delete limitations Delete limitations
111	Total Suspended Solids ("TSS") Oil and Grease ("O&G")	Reduce to 1/month Reduce to 1/month
113	TSS CBOD	Reduce to 1/month Reduce to 1/month
301	TSS O&G	Reduce to 1/month Reduce to 1/quarter
313	TSS O&G	Reduce to 1/month Reduce to 1/month
401	TSS O&G	Reduce to 1/month Reduce to 1/quarter
403	TSS O&G TRC	Reduce to 1/month Reduce to 1/month Reduce to 1/month

B. Suggested Changes to Specific Outfalls and Permit Conditions

1. Outfall 501 – Outfall 501 should be deleted from the Permit because this discharge is no longer used.
2. Outfall 002 – The phrase “decanted river water” should be added to the discharge description for Outfall 002.
3. Outfall 102 - Intermittent occurrences of high river suspended solids directly impact total suspended solids (“TSS”) discharges from Internal Outfall 102. As previously communicated to the Department in FENOC’s January 27, 2005 letter to the Water Management Program Manager (“January 27, 2005 Letter”), “once-through” river water is discharged from this outfall. The water is not treated prior to or after use. Discharges from this outfall are unaltered river water and similar to once-through non-contact cooling water streams that are not limited for TSS in other industrial NPDES permits. FENOC requests that the Department remove the TSS effluent limitations for Internal Outfall 102, or alternatively, provide a condition in the renewed Permit that allows for consideration of river intake TSS concentrations in any compliance determination. *See*, 25 Pa. Code § 95.2(b).
4. Outfall 003 – The phrase “intermittent non-contact cooling water leakage/drainage” should be added to the discharge description for Outfall 003.
5. Outfall 203 – The “percent removal” limitations should be deleted for Outfall 203 because the Station is consistently meeting the other effluent limitations set forth in the existing Permit for this outfall. In addition, Condition C.4 also should be removed.
6. Outfall 403 – The description of Outfall 403 should be clarified to explain that this discharge is intermittent. The flow from this outfall is normally routed to the Unit No. 1 Clarifier for discharge at Outfall 103. Only on occasion it is routed to Outfall 403 for discharge via Manhole 1B34
7. Outfall 503 – A new Outfall 503 should be added to the Permit for the noncontact cooling water from the emergency diesel generator heat exchanger.
8. Outfall 006 – The phrase “decanted river water” should be added to the discharge description for Outfall 006.

9. Outfall 007

- a. The measurement frequencies for all parameters at Outfall 007 should be changed from "1/week" to "2/discharge," in order to be consistent with the intermittent notice of this discharge.
- b. The description for Outfall 007 should be revised to state "Auxiliary intake system testing water and periodic discharge from Unit #1 and Unit #2 once through cooling water from heat exchangers and closed loop cooling water leakage."

10. Outfall 008

- a. FENOC requests permission to route "Outage cooling tower blowdown" to Outfall 008 via flexible piping. During such discharges, the limits from Outfall 004 should apply to the discharge.
- b. Other than the occasional discharge of outage cooling tower blowdown, this outfall should be changed to "stormwater only" and the effluent limits eliminated because the Unit # 1 cooling tower pumphouse drains have been recycled back to the recirculating water system.

11. Outfall 010 – The phrase "Closed loop cooling water leakage" should be added to the discharge description for Outfall 010.

12. Outfall 011

- a. The phrase "Intermittent noncontact cooling water leakage/drainage" and the "occasional, intermittent flows" listed on the flow schematic should be added to the discharge description for Outfall 011.
- b. The phrase "Deionized water storage tank drainage" should be added to the discharge description for Outfall 011, and a reference to Outfall 011 should be added to Condition C.17.

13. Outfall 012 – There presently is no discharge from this outfall. It is anticipated that the existing HVAC system (ERF evaporative coolers) will be retrofitted with stainless steel water coolers by the end of 2006, at which time the zinc and copper limitations/monitoring requirements for this outfall should be deleted.

14. Outfall 013 – As previously described in FENOC's letter of January 27, 2005, the copper, chlorobenzene, and cyanide limitations/monitoring requirements for Outfall 013 should be deleted for the following reasons.

Monitoring data collected for Outfall 013 during 2003 through April 2006 demonstrate that if the monthly average effluent limit of 50 ug/L for copper was in effect, it would have been exceeded four times, of which two were by less than 10 ug/L. There would have been no exceedances of the monthly average effluent limit since September 2004. Monthly average effluent concentrations have been less than 30 ug/L for 33 of the 40 months during 2003 through April 2006. As previously described to the Department, the Phase I TRE did not reveal a consistent or readily controllable source of copper to the Outfall 013 discharge.

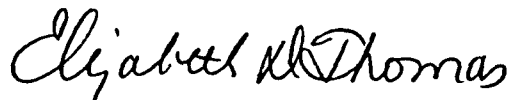
FENOC is planning to discharge Unit #1 sanitary wastewaters and Unit #2 sanitary wastewaters (currently Internal Outfall 113) to a new sanitary treatment plant recently constructed by the Borough of Shippingport. The cost to FENOC for its share of construction and the tie-in will be approximately \$3,000,000. When the diversion of BVPS sanitary wastewaters occurs (expected completion in 2007), discharges from Outfall 013 to Peggs Run will consist of low-volume overflows from one oil/water separator (Internal Outfall 313), storm water and possibly ground water infiltration to the Outfall 013 sewer.

15. Outfall 113 – The “percent removal” limitations should be deleted for Outfall 113 because the Station is consistently meeting the other effluent limitations set forth in the existing Permit for this outfall. In addition, Condition C.4 also should be removed.
16. Outfall 213 – Outfall 213 should be deleted from the Permit because the pumphouse pump leakage now recycles back to the recirculating water system.
17. Outfall 413 – Outfall 413 should be removed from the Permit because discharges from this outfall comprise only storm water that is ultimately discharged through Outfall 013. The purpose of the oil/water separator located at this outfall is only to respond to an oil release should it occur. FENOC has taken appropriate steps to ensure that such releases do not occur, in part, by requiring the drainage valve to be in the “off” position during all loading and unloading activities.
18. Outfalls 014, 015, 016, 017, 018, and 019 – These outfalls should be added to the Permit as “stormwater only” discharges.
19. Condition C.4 – This condition should be deleted from the Permit, in conjunction with the requests that the efficiency limits for Outfalls 113 and 203 be eliminated.
20. Condition C.14 – Condition C.14 should be redrafted as set forth in Appendix B hereto, to more accurately reflect the wet layup activities at BVPS.
21. Condition C.15 -Condition C.15 should be redrafted as set forth in Appendix C hereto, to more accurately reflect the biocide activities at BVPS.

22. Condition C.17 - A reference to Outfall 011 should be added to Condition C.17.
23. Conditions C.20, C.21, and C.22 - Conditions C.20, C.21, and C.22 should be deleted because these activities have been completed.
24. Condition C.25 - Condition C.25 should be deleted because the issue is moot (see Comment to Outfall 013, above).

Thank you for this opportunity to proactively address potential issues regarding the renewal of the Permit. We are available to discuss any issues identified in this letter at your earliest convenience. Please feel free to contact Mr. Michael Banko at 724-682-4117, who will serve as our point-of-contact.

Sincerely yours,



Elizabeth D. Thomas
Manager, Environmental & Chemistry

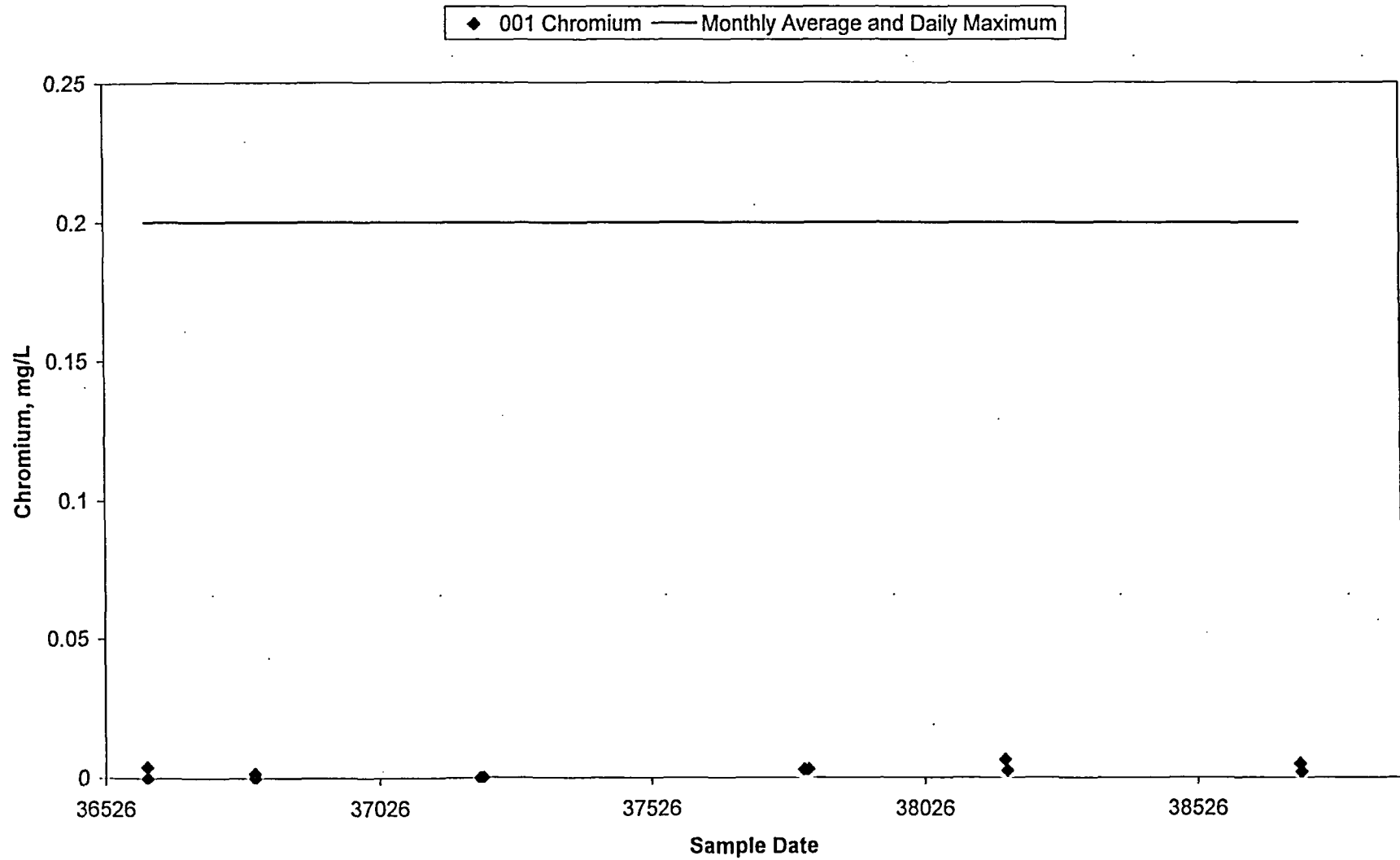
edt/mab

Attachments

cc: R. G. Mende
M. D. Banko

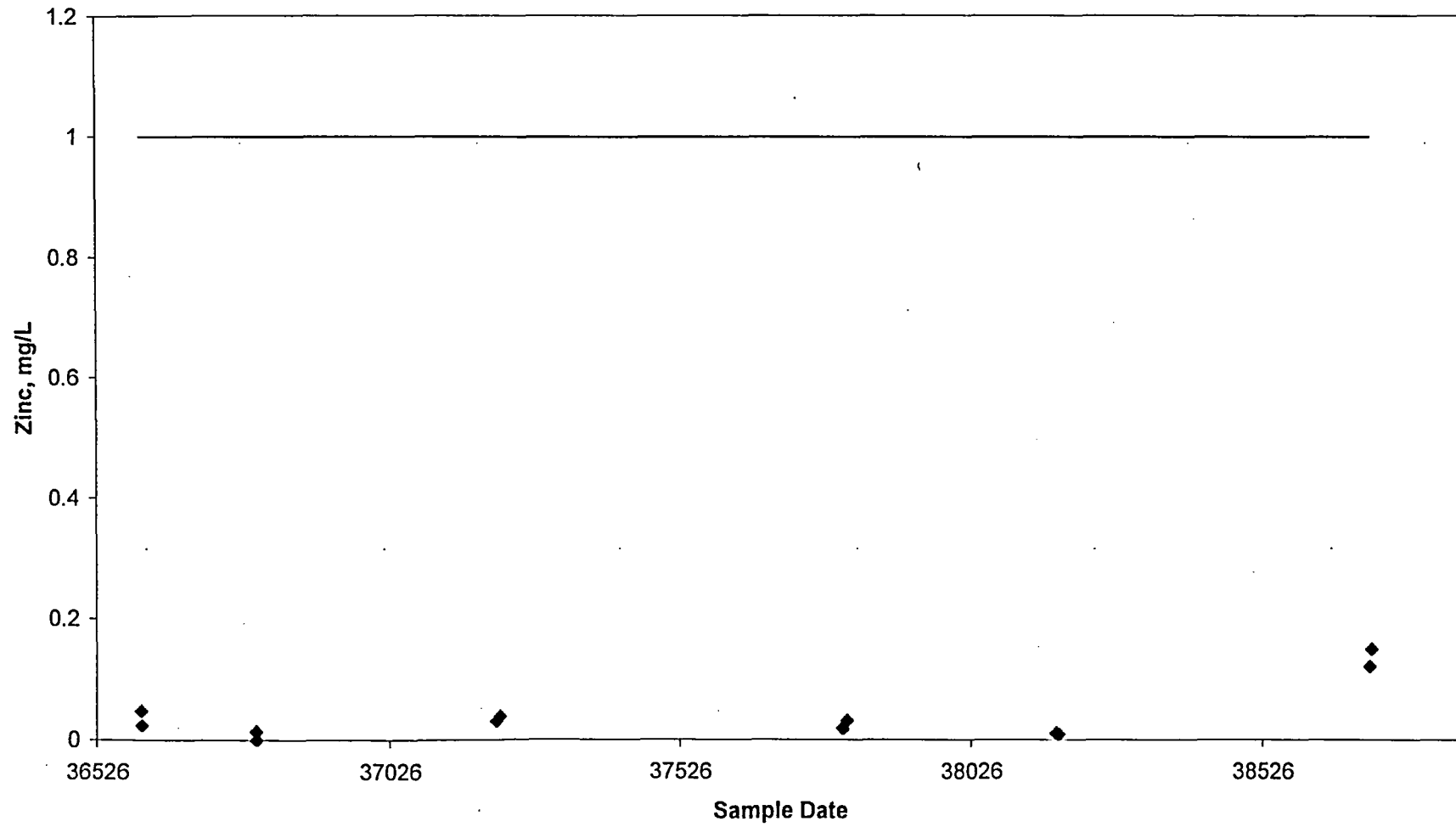
EXHIBIT A

NPDES Outfall 001
Chromium

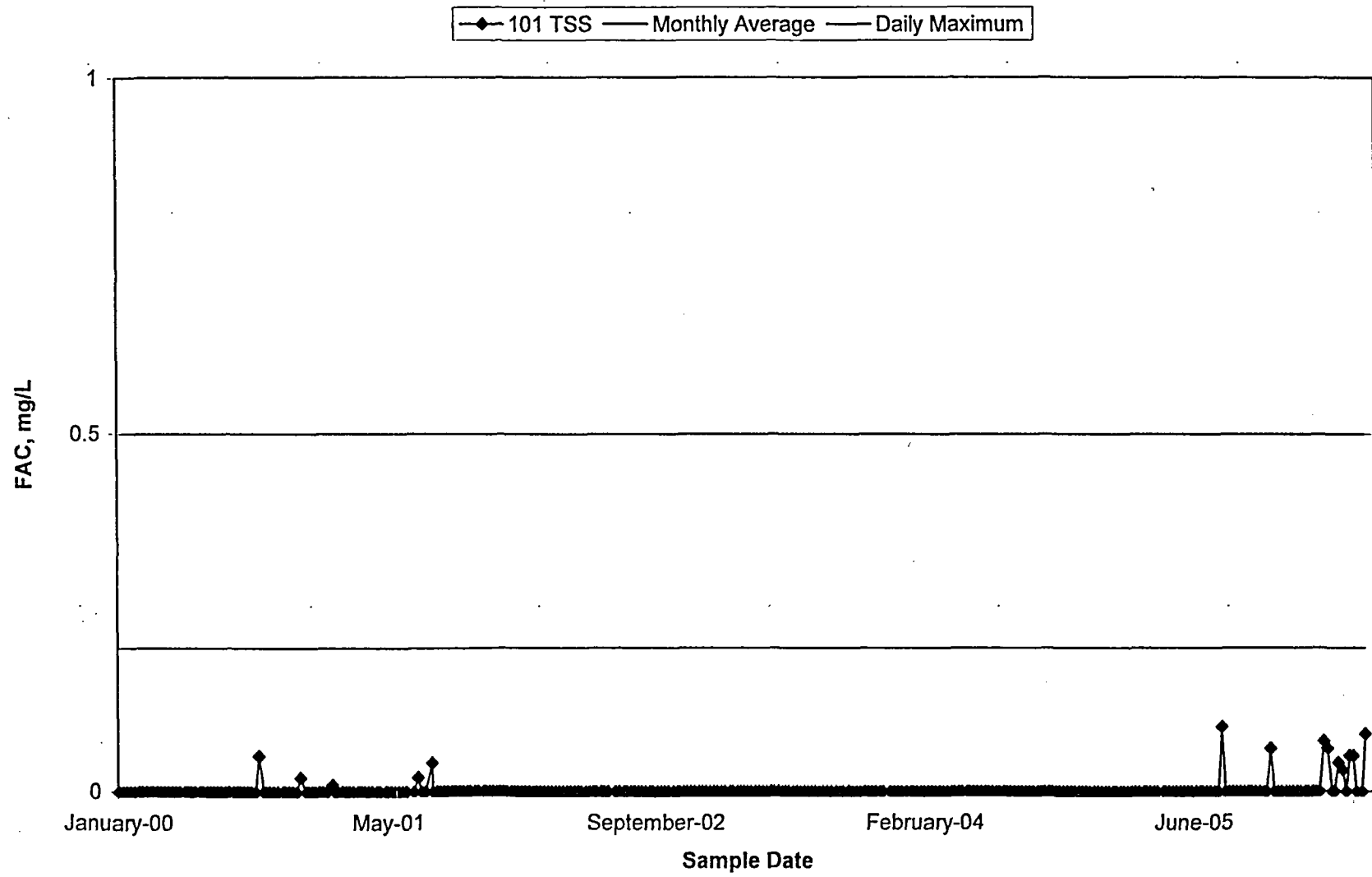


NPDES Outfall 001
Zinc

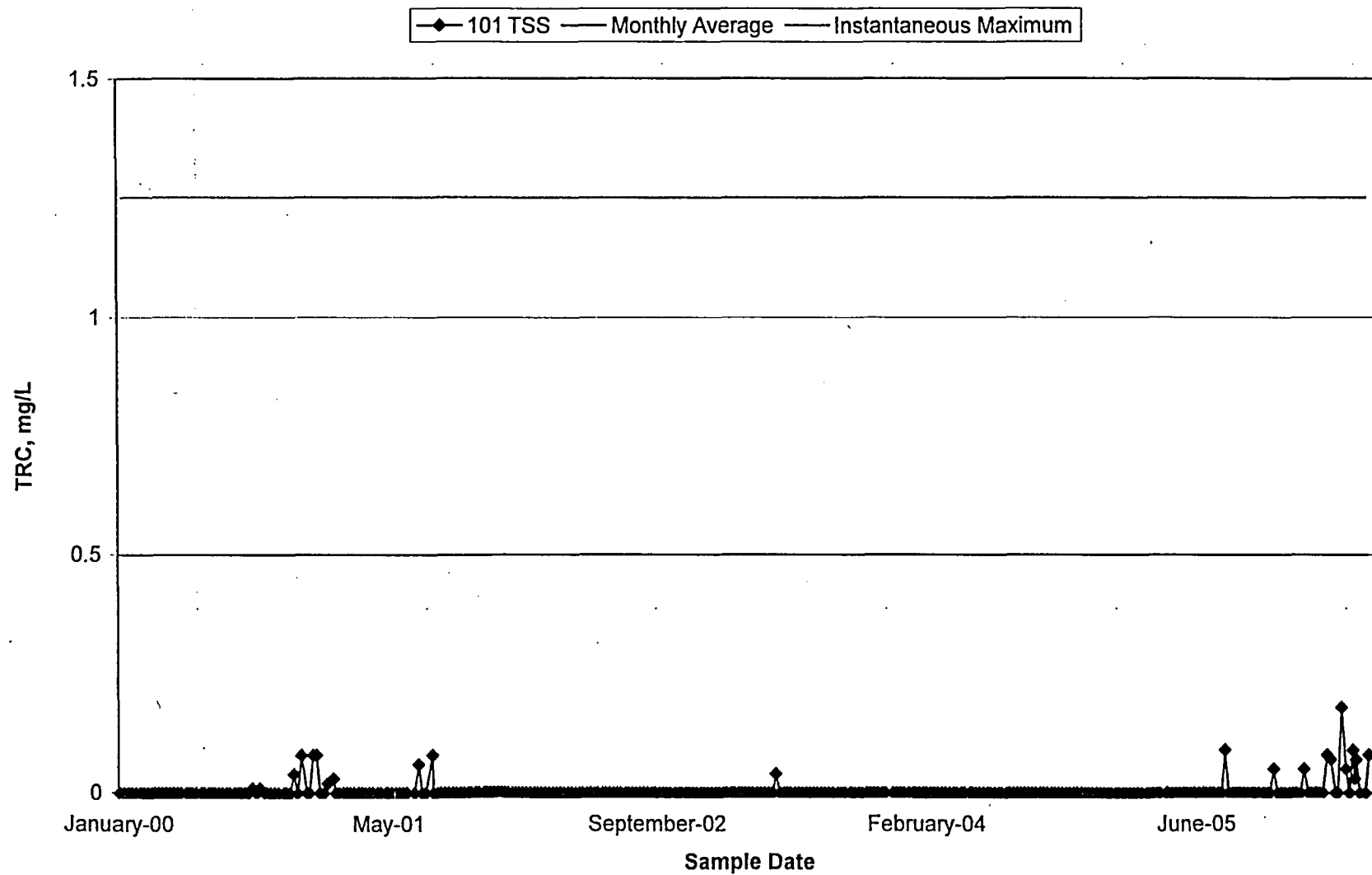
◆ 001 Zinc — Monthly Average and Daily Maximum



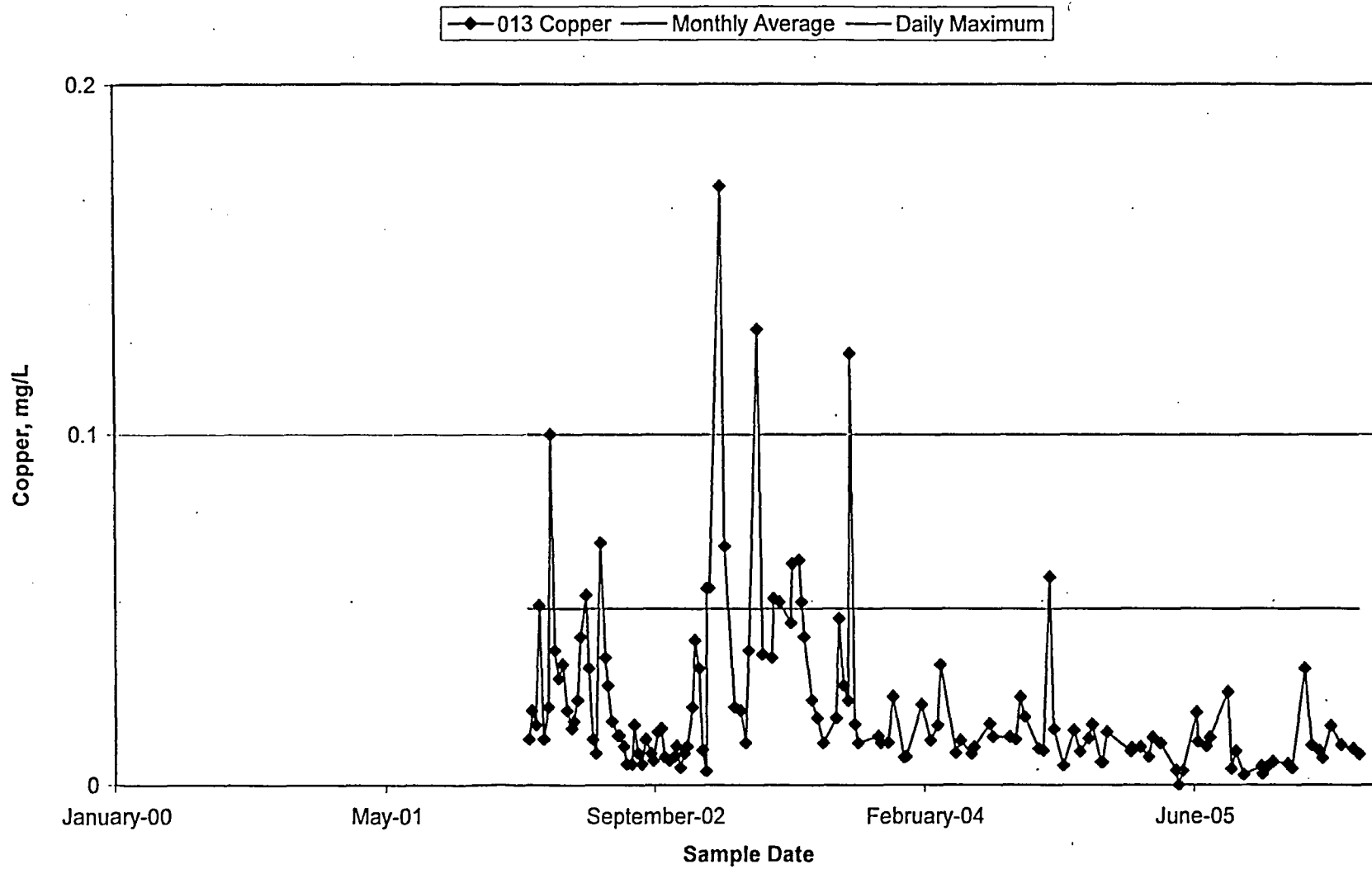
NPDES Outfall 010
Free Available Chlorine



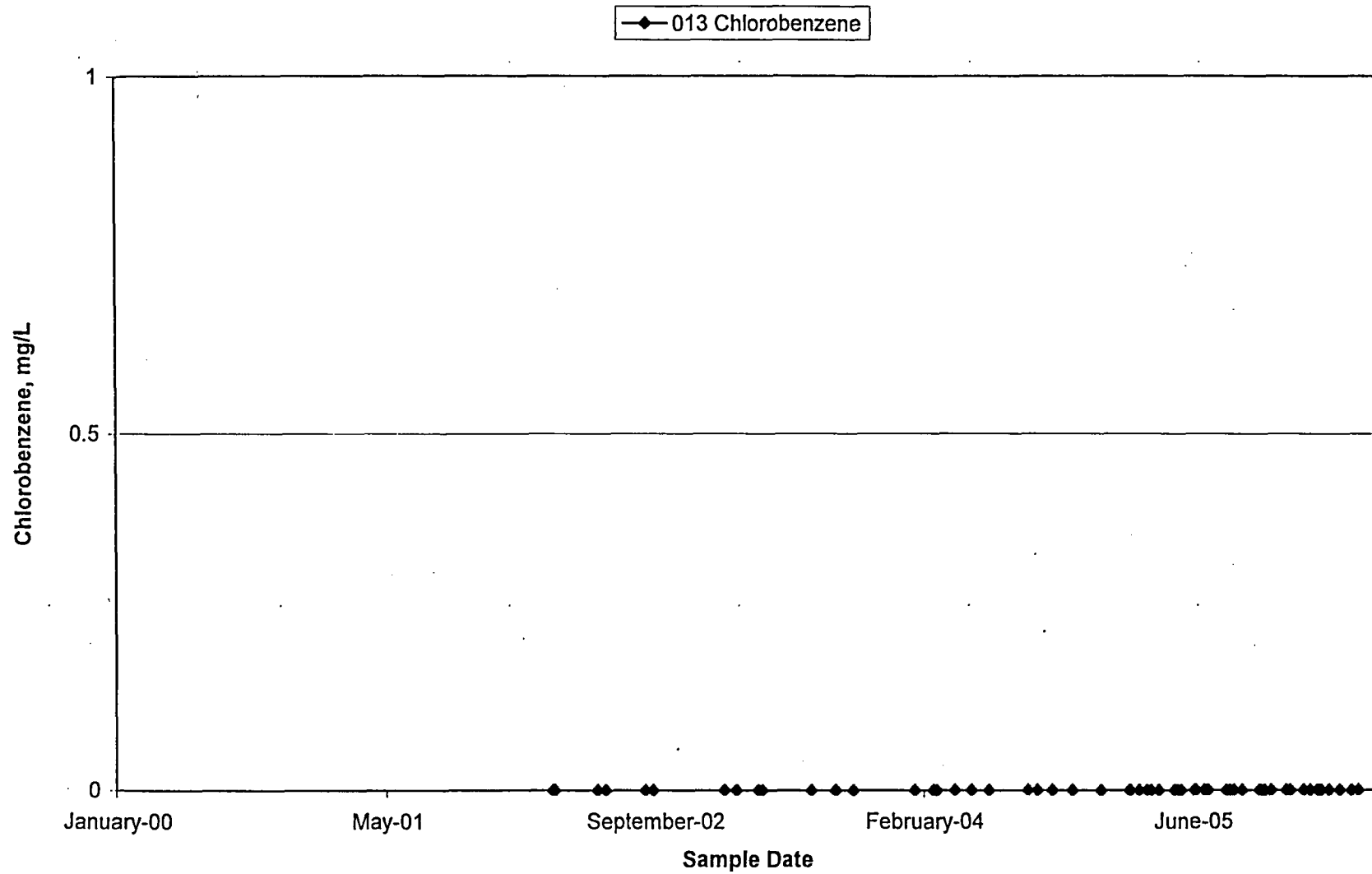
NPDES Outfall 010
Total Residual Chlorine



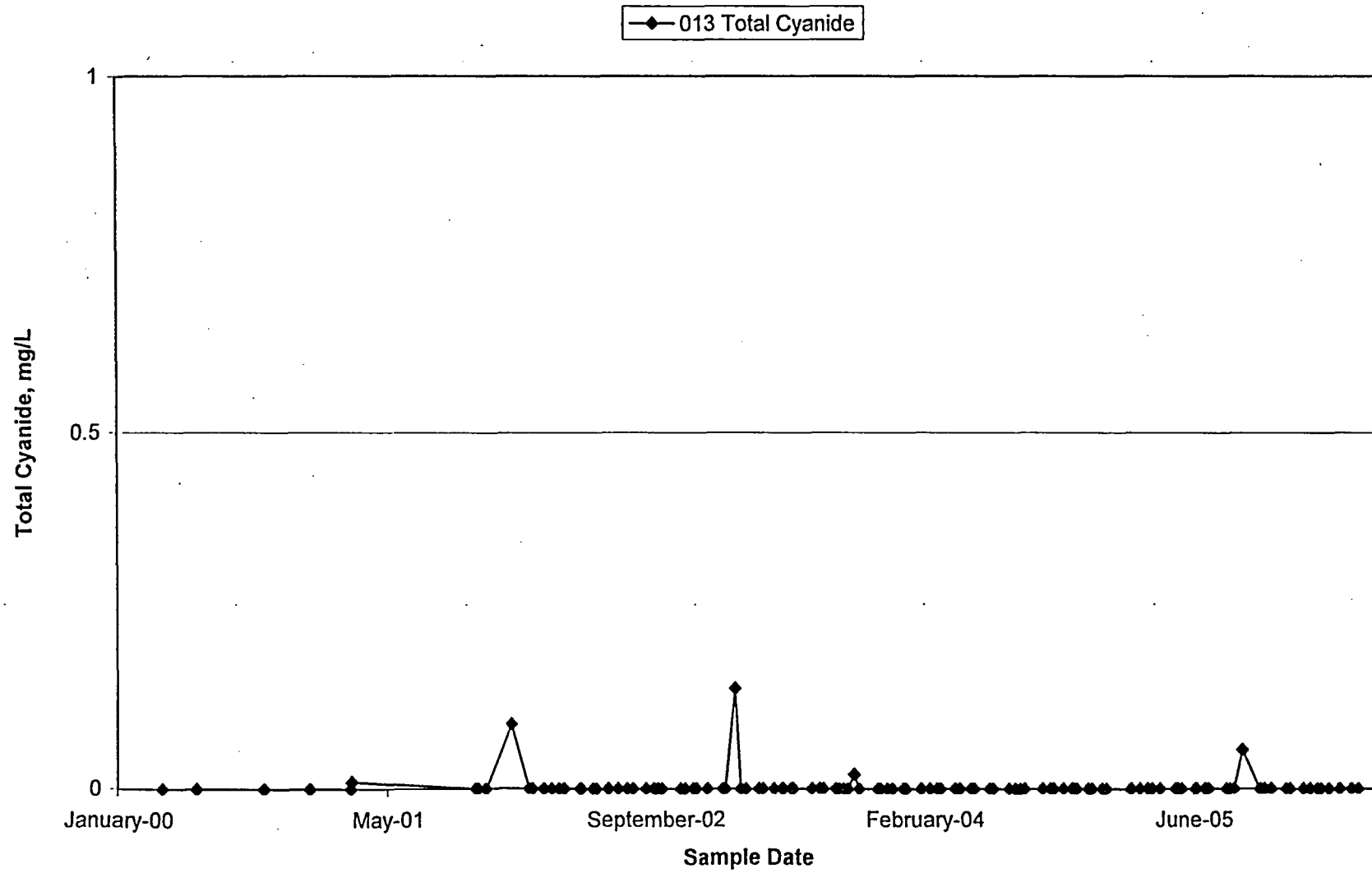
NPDES Outfall 013
Copper



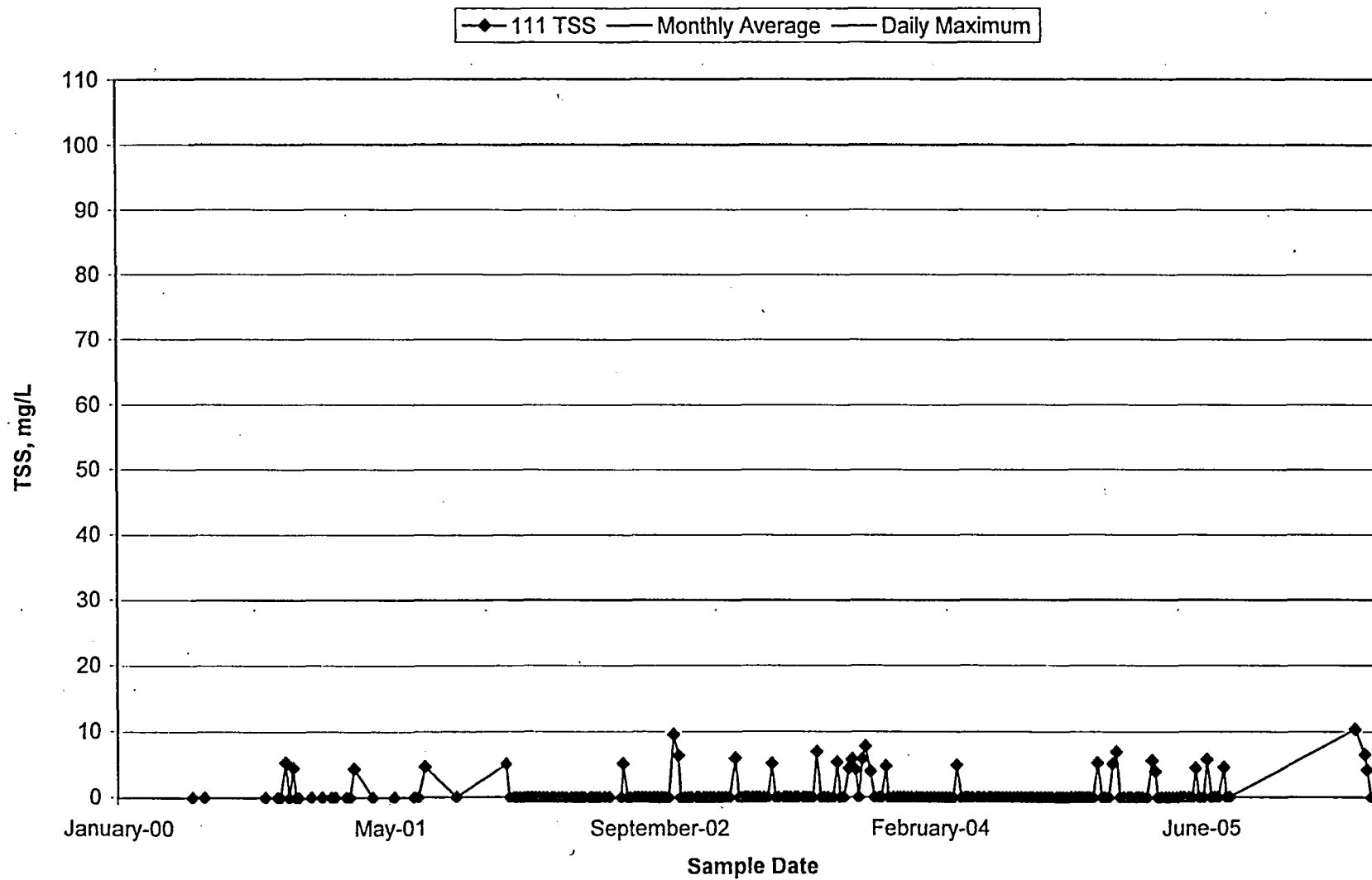
NPDES Outfall 013
Chlorobenzene



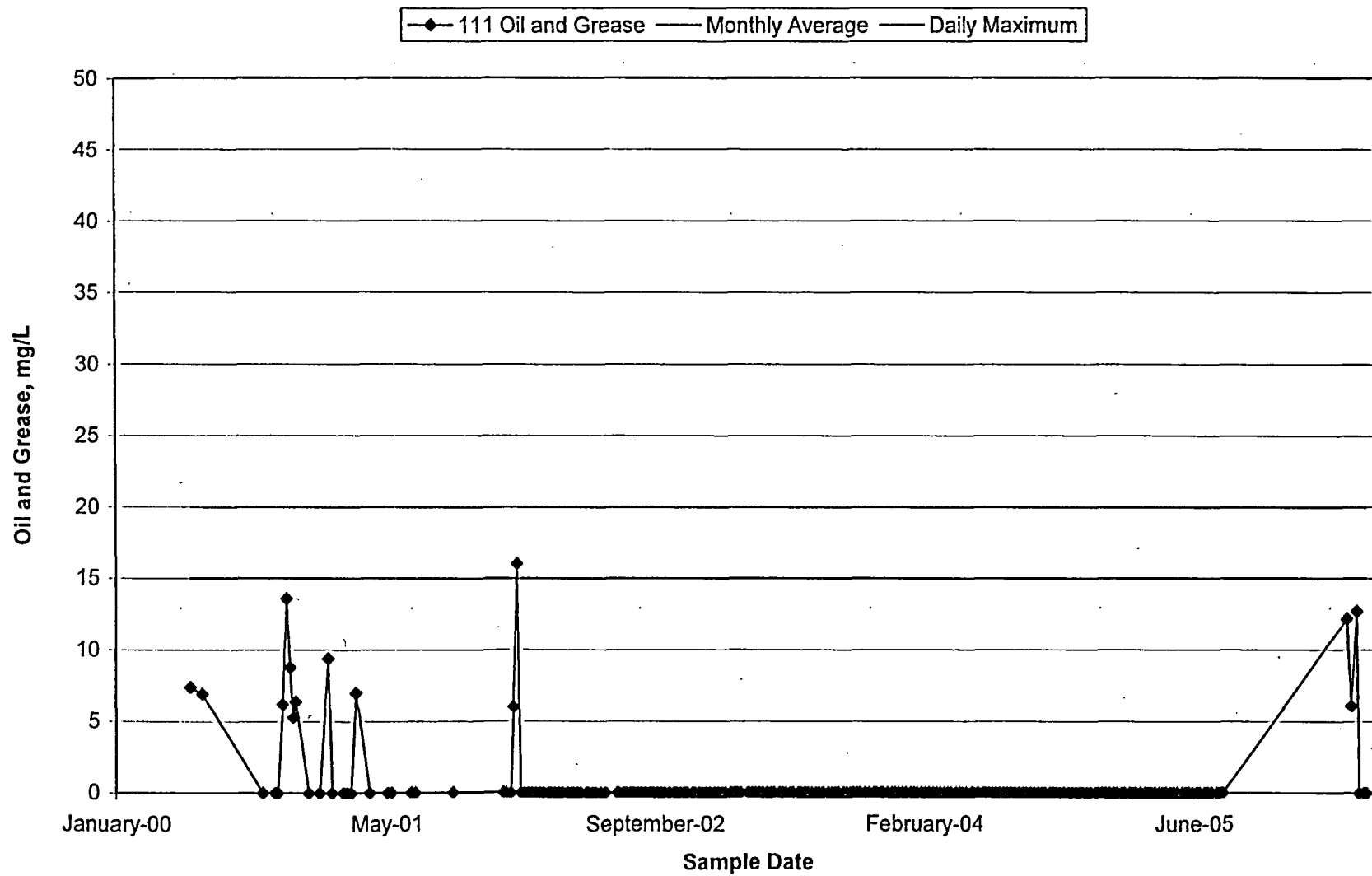
NPDES Outfall 013
Total Cyanide



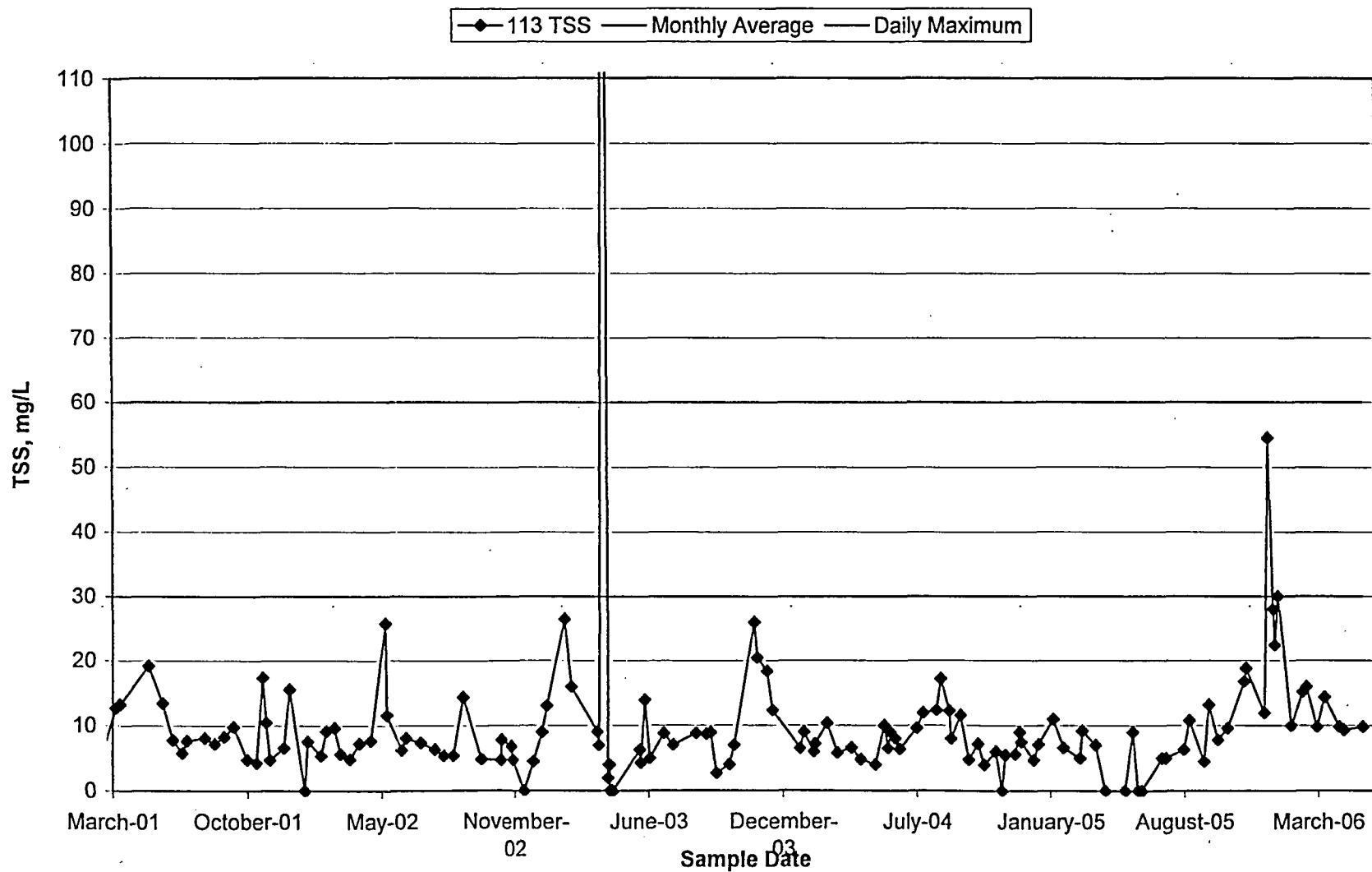
NPDES Outfall 111
Total Suspended Solids



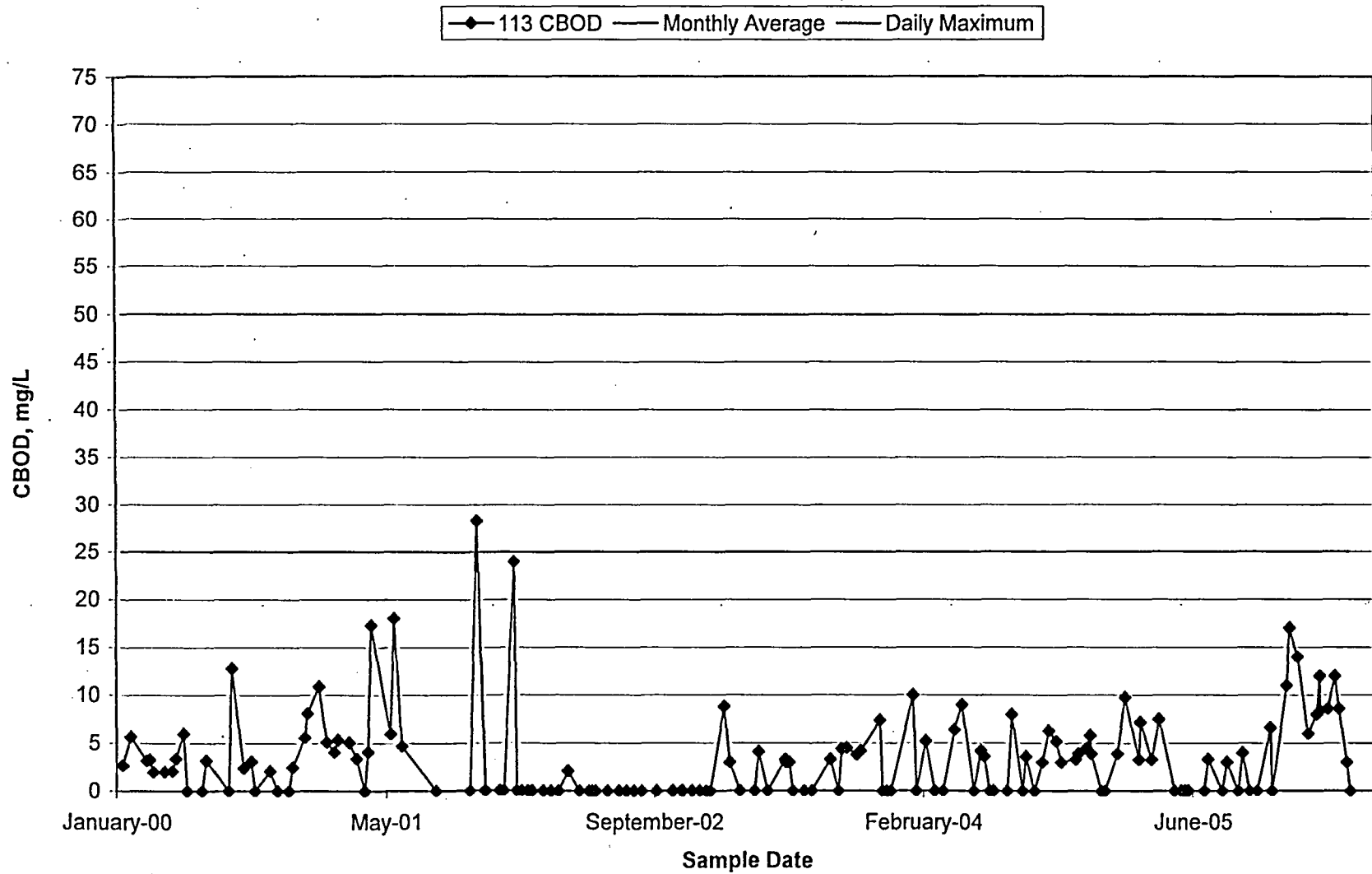
NPDES Outfall 111
Oil and Grease



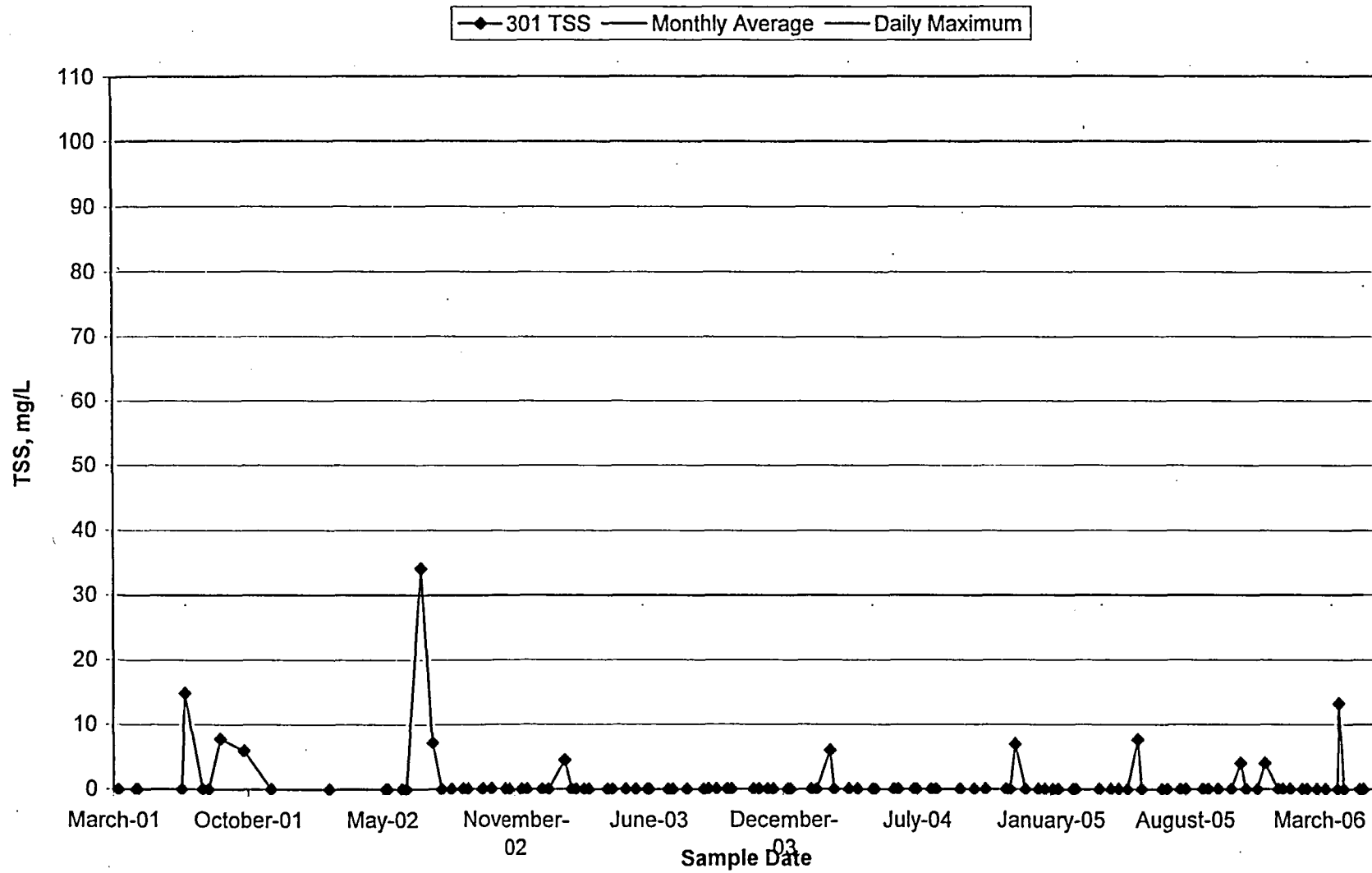
NPDES Outfall 113
Total Suspended Solids



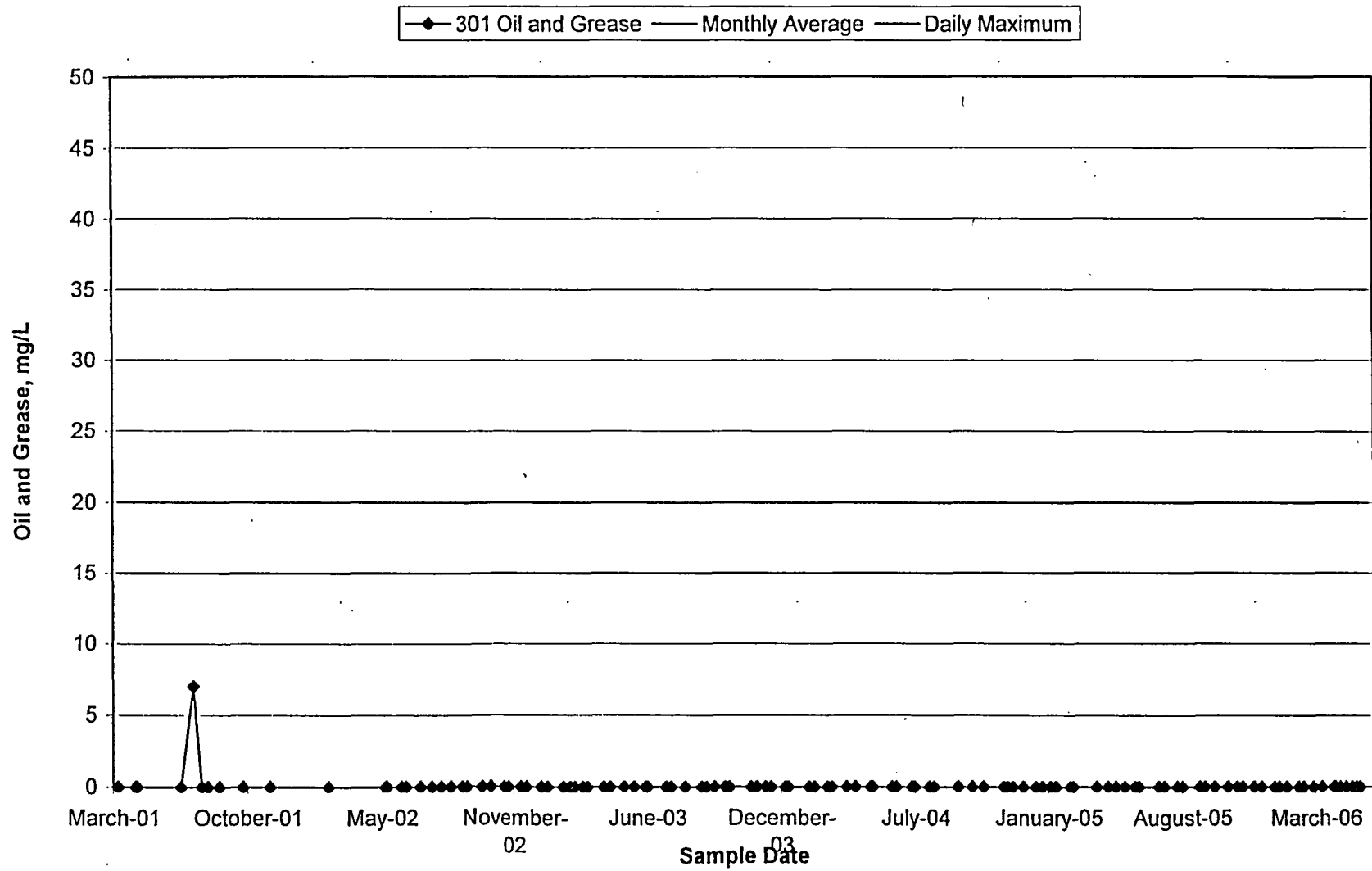
NPDES Outfall 113
CBOD



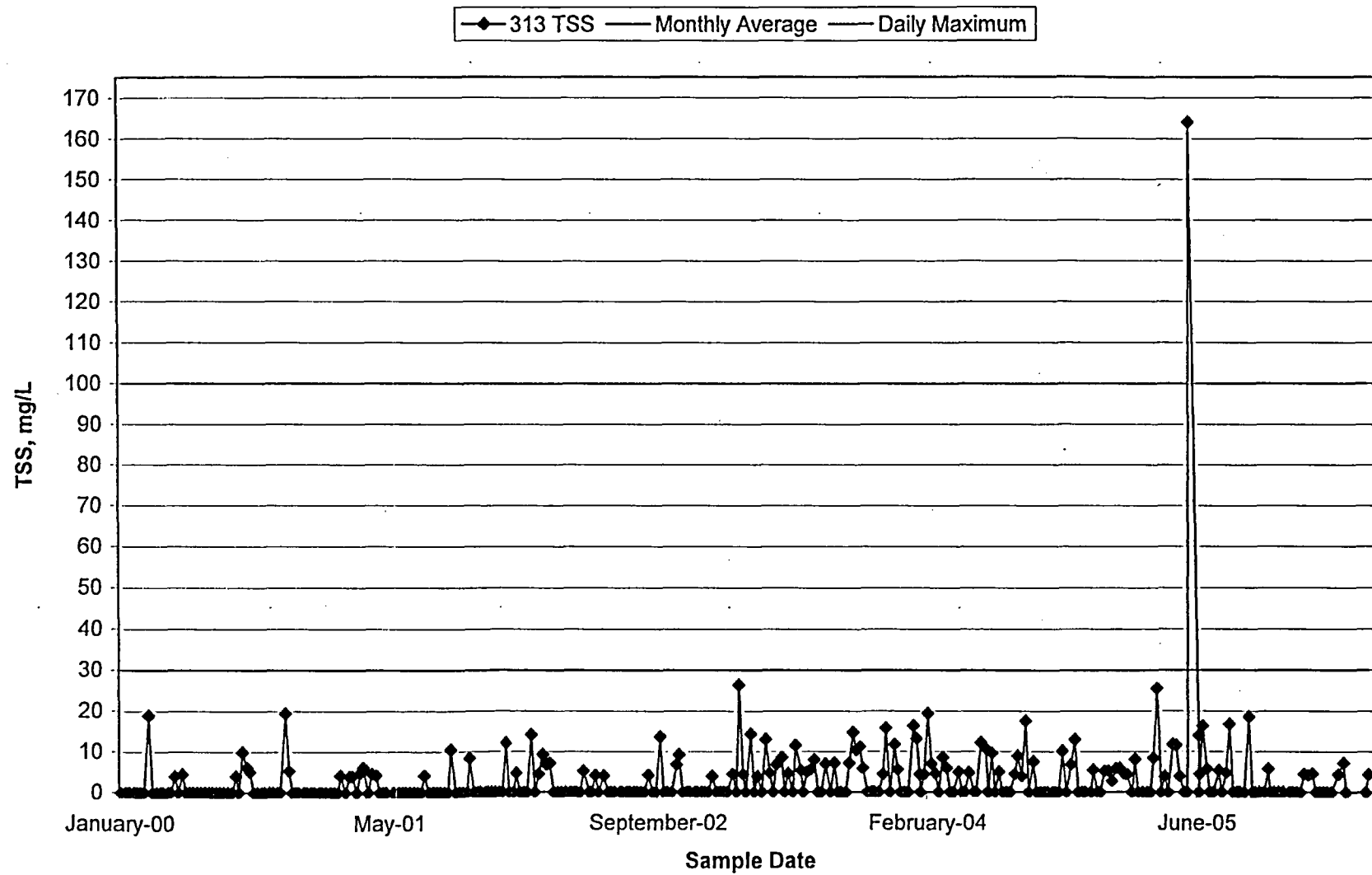
NPDES Outfall 301
Total Suspended Solids



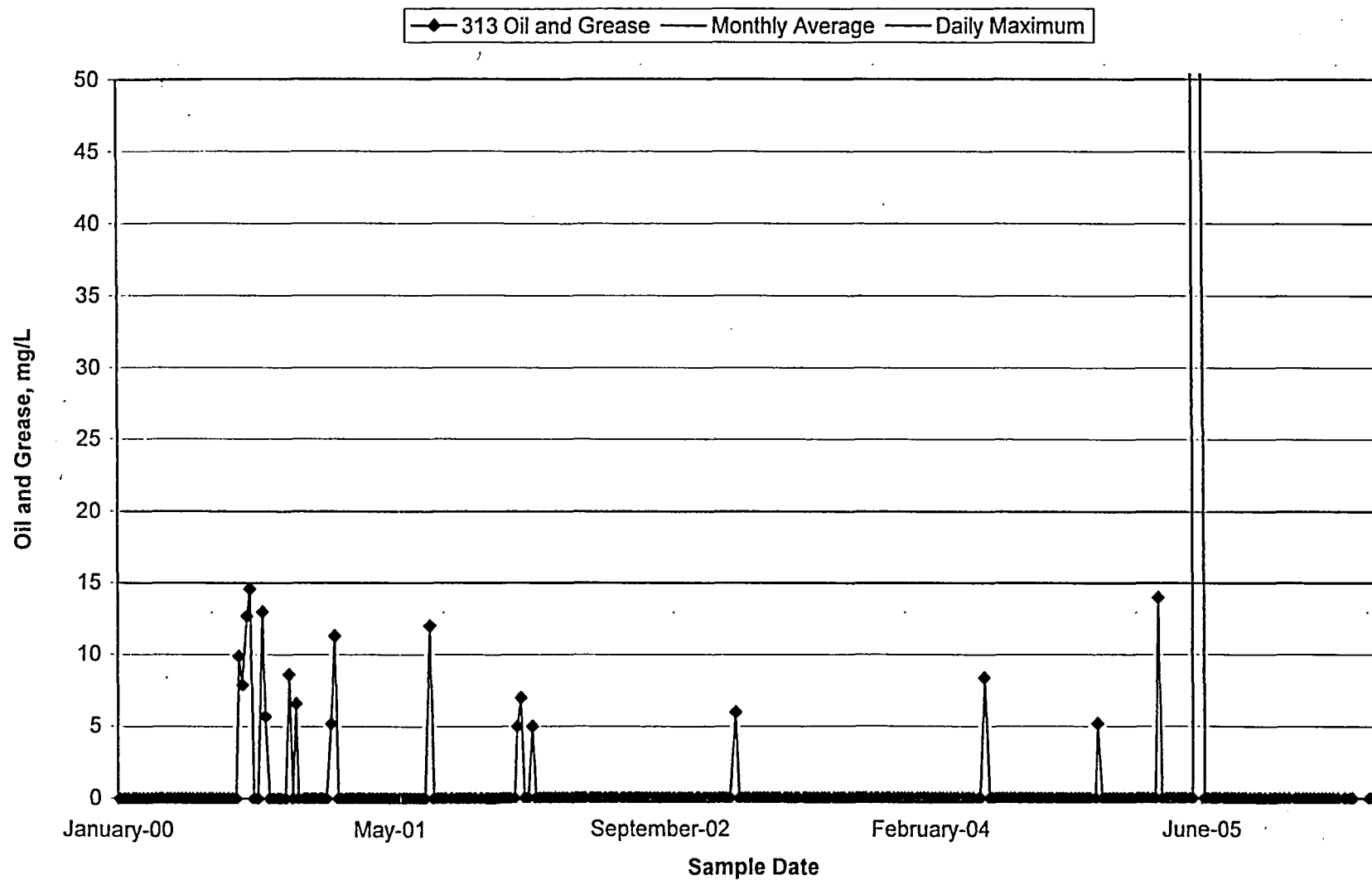
NPDES Outfall 301
Oil and Grease



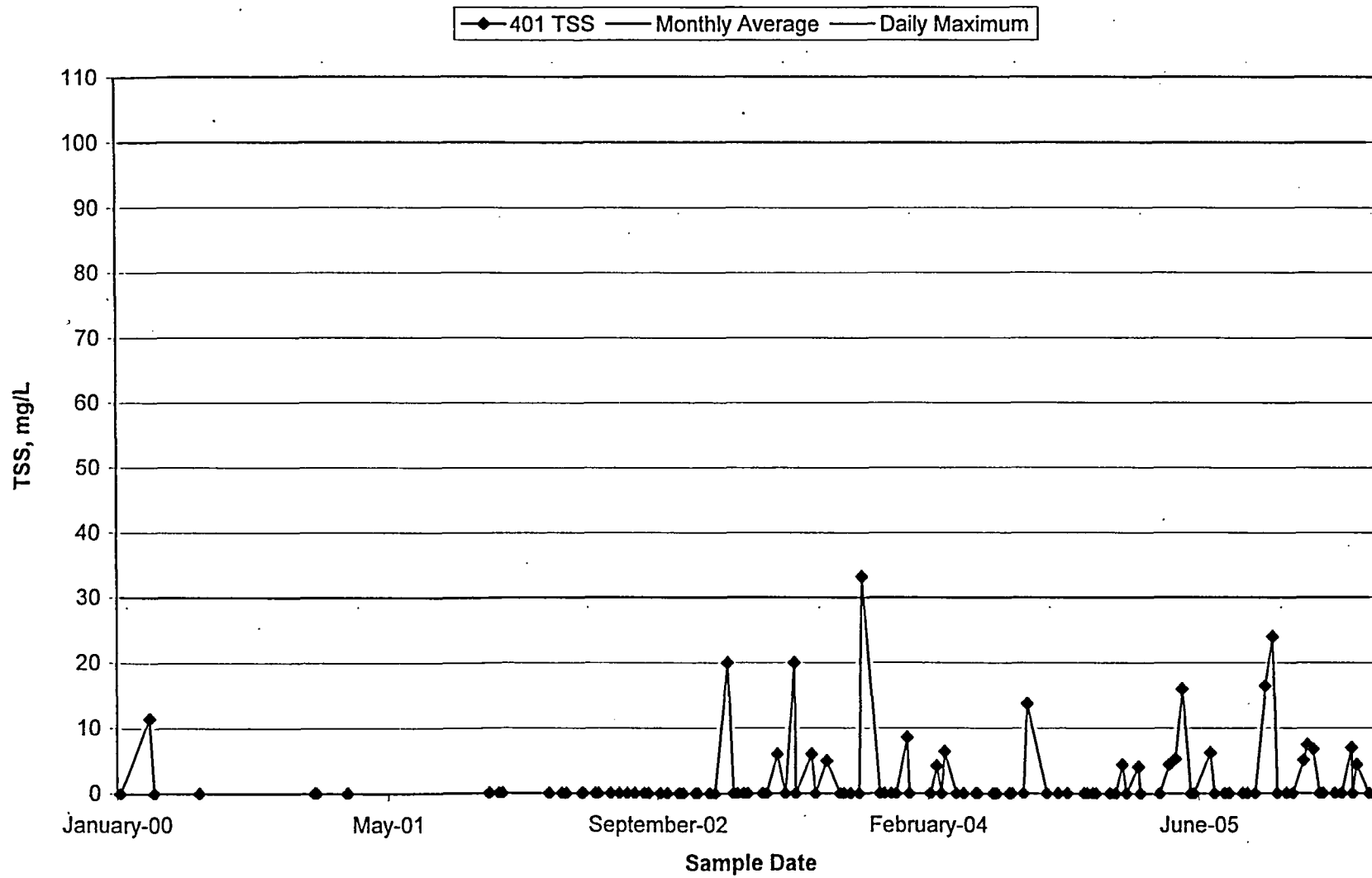
NPDES Outfall 313
Total Suspended Solids



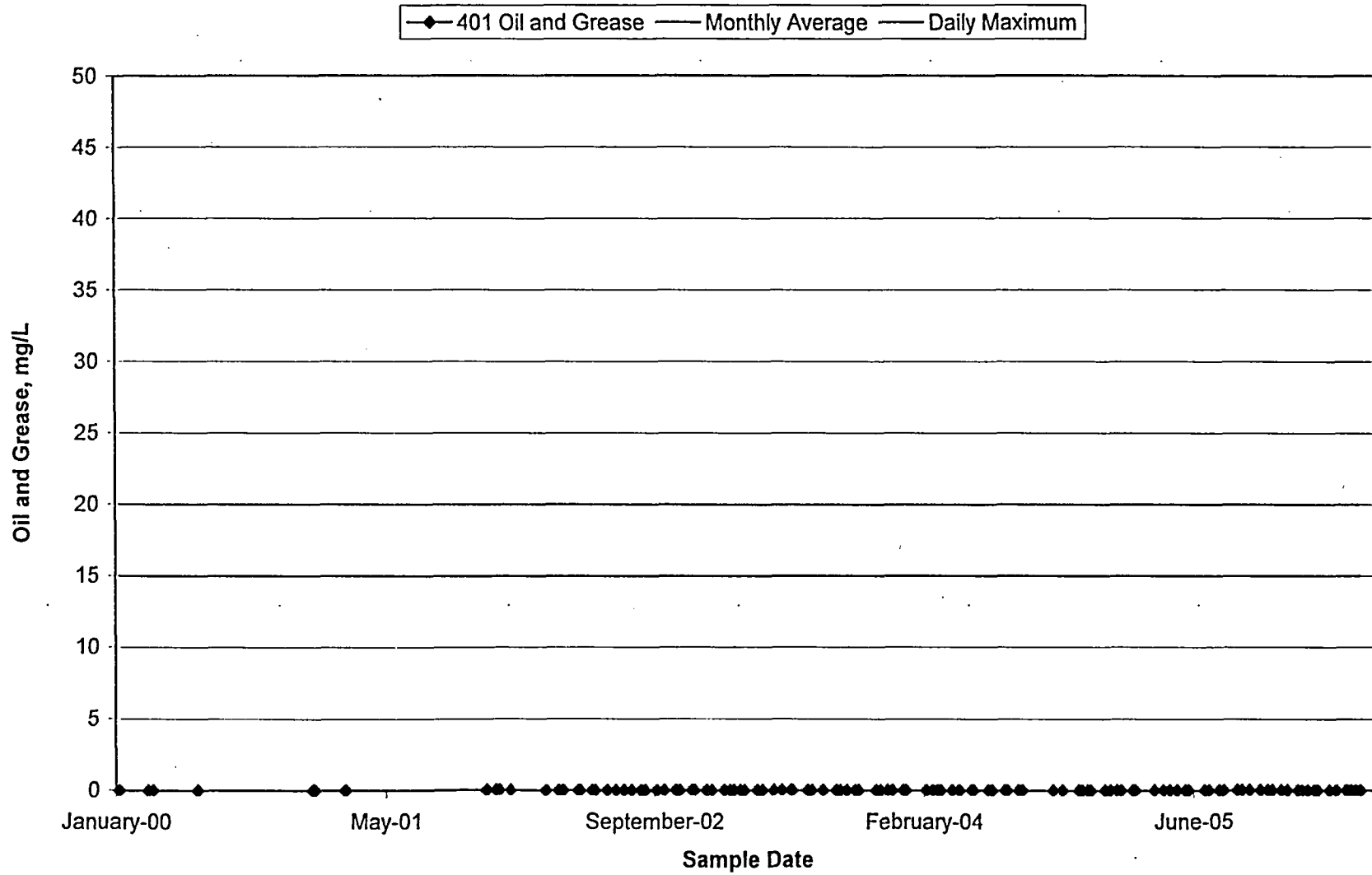
NPDES Outfall 313
Oil and Grease



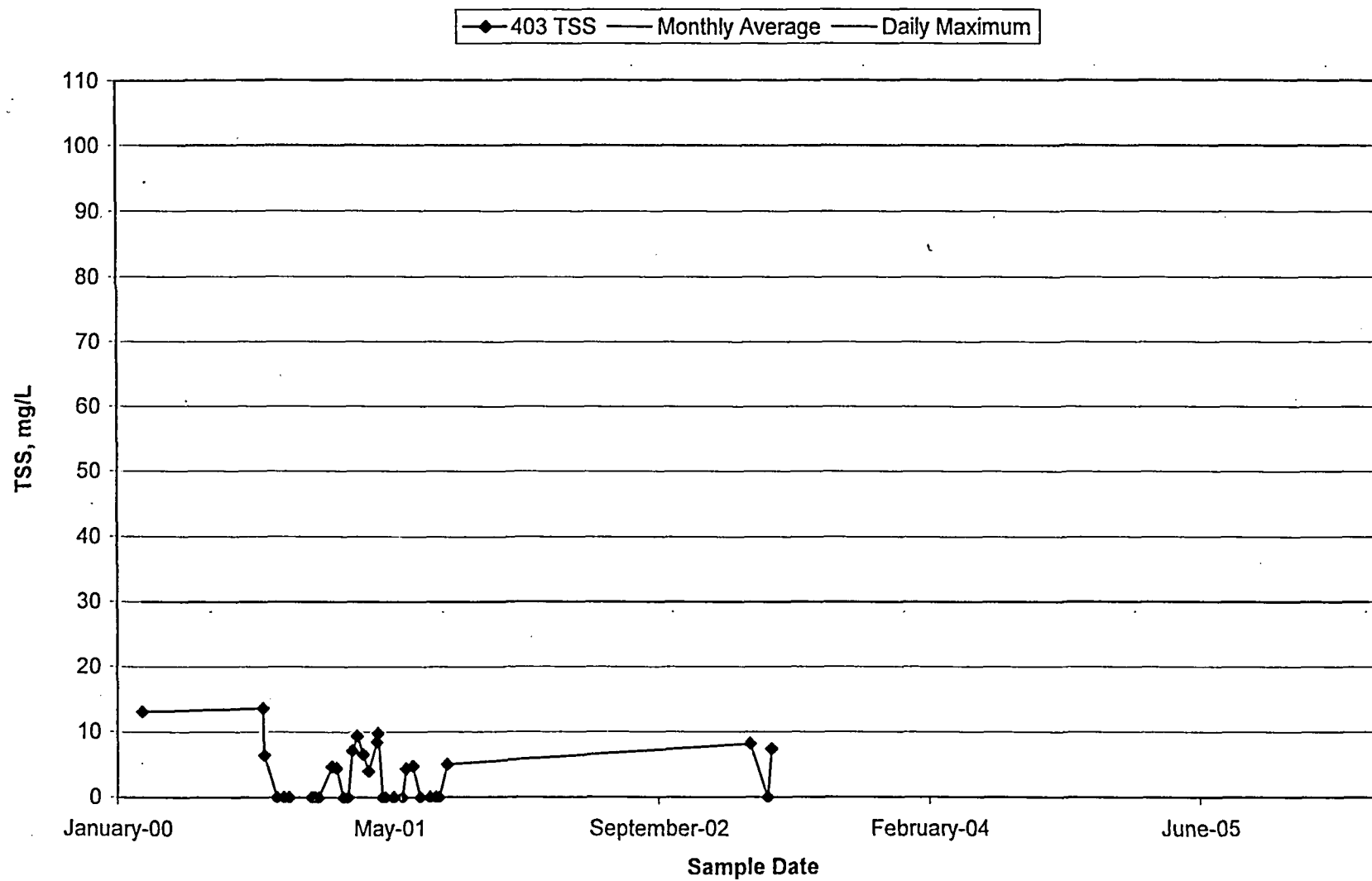
NPDES Outfall 401
Total Suspended Solids



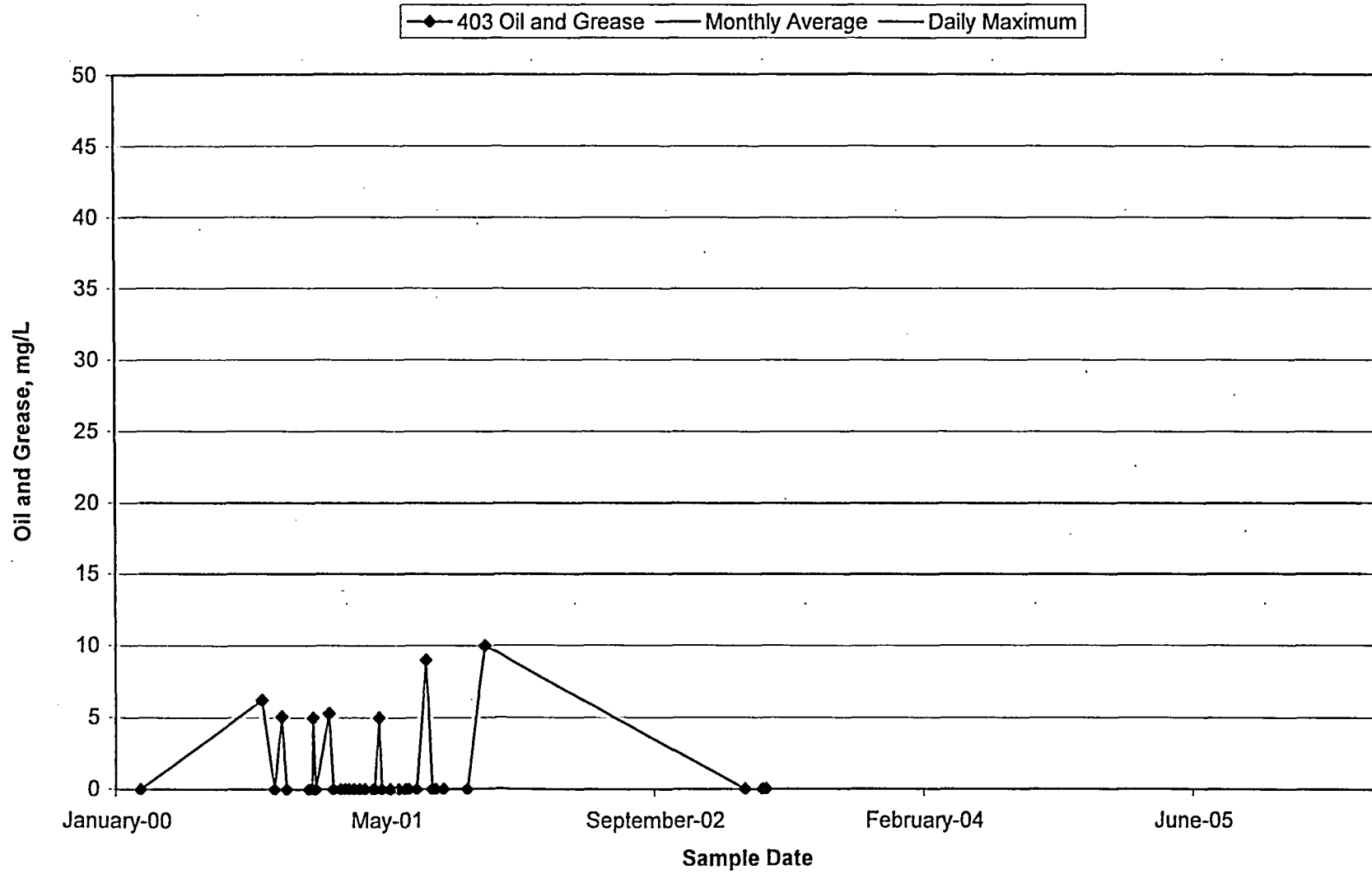
NPDES Outfall 401
Oil and Grease



NPDES Outfall 403
Total Suspended Solids



NPDES Outfall 403 Oil and Grease



NPDES Outfall 403 Total Residual Chlorine

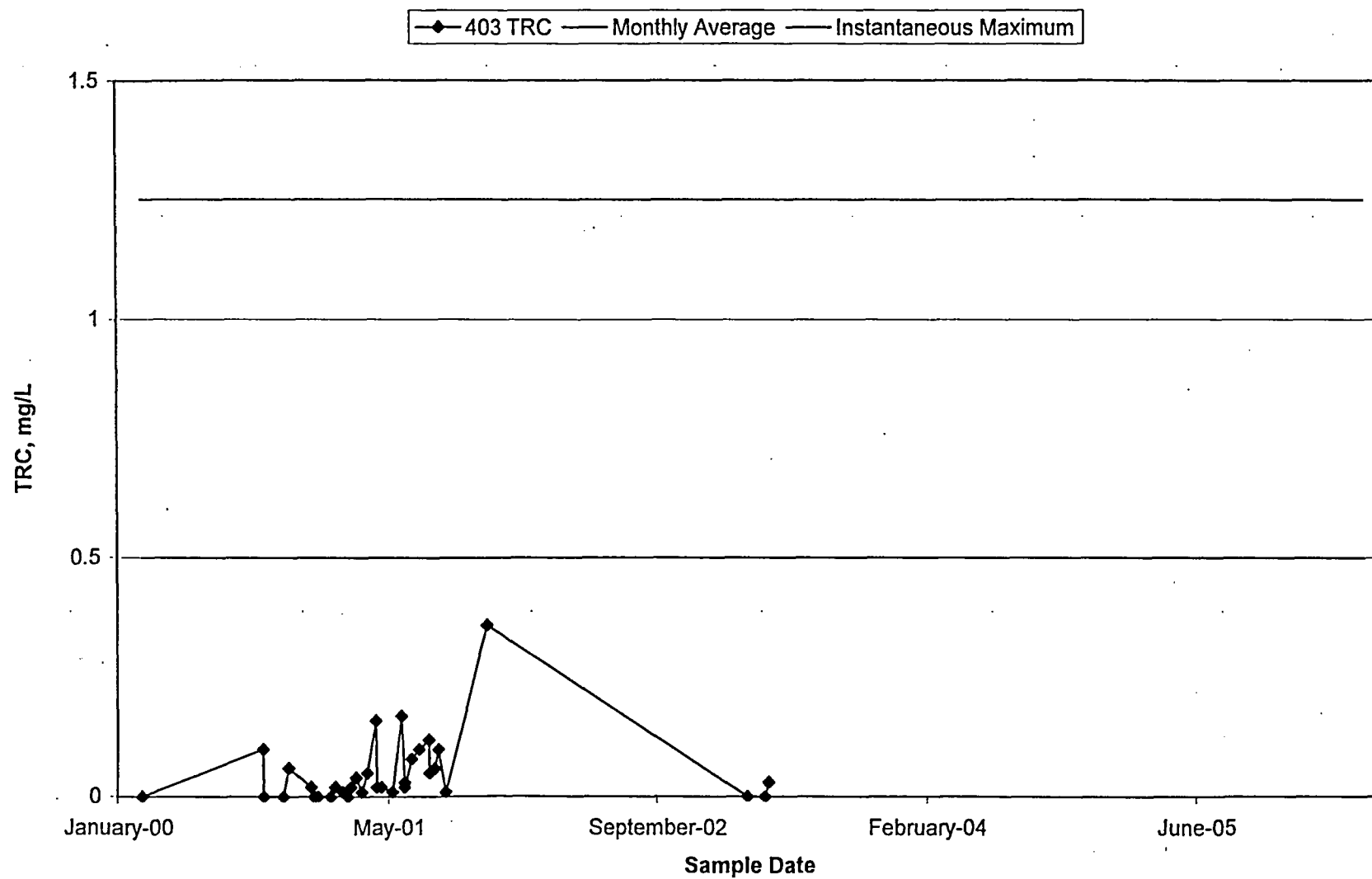


EXHIBIT B

Condition C.14

The permittee is authorized to use chemical additives, subject to the following:

- A. No chemical addition for control of corrosion, scaling, algae, slime or fouling shall be made to a cooling or boiler system which has a discharge covered by this permit, without prior approval by the Department.
- B. The permittee is authorized to use a 35% solution of hydrazine at a rate of 1 to 40 gallons per day during normal operations, and up to 120 gallons per day when placing steam generators in wet layup conditions. Wet layup occurs during refueling outages. Each unit has a refueling outage every 16 to 18 months, and each has three steam generators. Therefore, wet layup generally occurs twice per year, but in certain years it occurs only once.

The permittee is authorized to use a 30% solution of hydrogen peroxide or appropriate amounts of sodium hypochlorite at Outfalls 101 and 403 to oxidize unreacted Hydrazine from wet layup of the Unit #1 and Unit #2 secondary systems (Steam Generators) provided compliance with effluent pH limitations is maintained.

EXHIBIT C

Condition C.15 – Asiatic Clam Control

- A. To treat systems for macrofoulers (e.g., Asiatic clams and Zebra mussels), the permittee is authorized to add 7,000 pounds per day of biocide (e.g., GEBetz Powerline 3627 or equivalent in accordance with condition C.11 of this Permit) and 21,000 pounds of bentonite-based detoxicant (e.g., GEBetz DT-S or equivalent in accordance with Condition C.11 of this Permit) for a period not to exceed 24 hours on an as-needed basis. These are maximum usage rates, and the permittee shall use lesser amounts when deemed appropriate. Efforts are to be made to minimize the addition of these chemicals. Simultaneous multi-unit dosing is prohibited.

Effluent limitations have been placed on Outfalls 001, 503, and 010. If any other outfall is affected, the biocide concentration is not to be detectable, and the detoxicant concentration shall not exceed 35 mg/l (maximum daily). The amount of detoxicant is to be estimated using the feed rate and discharge flow rate.

The permittee will ensure that effluent during macrofouling treatment is detoxified prior to discharge. If visual observation of the effluent exhibits toxicity or impairment to the receiving stream's aquatic life, use is to be terminated immediately.

The permittee shall submit advanced (14 days) written notice of any large system dosings. Reports with the conclusions of large system dosings shall be submitted 120 days after dosing.

- B. For microbiological control treatments, the permittee is authorized to treat with biocide (e.g., GEBetz Powerline 3627 or equivalent in accordance with Condition C.11 of this Permit) for up to two hours per day. Detoxification is not required if the microbiological control treatment is conducted in accordance with this provision.

FORM



**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION**

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the Department.

Related ID#s (If Known)		DEP USE ONLY Date Received & General Notes
Client ID# _____	APS ID# _____	
Site ID# _____	Auth ID# _____	
Facility ID# _____		

CLIENT INFORMATION

DEP Client ID# 99862	Client Type / Code OWNOP			
Organization Name or Registered Fictitious Name FirstEnergy Nuclear Operating Company	Employer ID# (EIN) 34-1881483	Dun & Bradstreet ID# 09-412-9264		
Individual Last Name	First Name	MI	Suffix	SSN
Additional Individual Last Name	First Name	MI	Suffix	SSN
Mailing Address Line 1 Beaver Valley Power Station		Mailing Address Line 2 Route 168		
Address Last Line – City Shippingport	State PA	ZIP+4 15077	Country USA	
Client Contact Last Name Banko	First Name Michael	MI D	Suffix III	
Client Contact Title Environmental Supervisor	Phone (724) 682-4117		Ext	
Email Address BankoM@firstenergycorp.com	FAX (724)682-4130			

SITE INFORMATION

DEP Site ID# 236413	Site Name FirstEnergy Nuclear Generation Company - Beaver Valley Power Station				
EPA ID# 04-02474 (SARA)	Estimated Number of Employees to be Present at Site				1,100
Description of Site Beaver Valley Power Station					
County Name Beaver	Municipality Shippingport	City <input type="checkbox"/>	Boro <input checked="" type="checkbox"/>	Twp <input type="checkbox"/>	State
County Name	Municipality	City <input type="checkbox"/>	Boro <input type="checkbox"/>	Twp <input type="checkbox"/>	State
Site Location Line 1		Site Location Line 2			
Site Location Last Line – City Shippingport	State PA	ZIP+4 15077			
Detailed Written Directions to Site Follow Route 60 North from Pittsburgh. Take Aliquippa Exit No. 10. Turn left onto Green Garden Rd. Travel for approximately 6 miles. At intersection of Route 18, turn right and then immediately left onto Shippingport Road. Travel for approximately 3 miles. Beaver Valley Power Station is on the right side of the road.					
Site Contact Last Name Banko	First Name Michael	MI D	Suffix III		
Site Contact Title Environmental Supervisor	Site Contact Firm				
Mailing Address Line 1 FirstEnergy Nuclear Operating Company	Mailing Address Line 2 Beaver Valley Power Station				
Mailing Address Last Line – City Shippingport	State PA	ZIP+4 15077			

Phone (724) 682-4117	Ext	FAX (724) 682-4130	Email Address BankoM@firstenergycorp.com
NAICS Codes (Two- & Three-Digit Codes – List All That Apply) (SIC = 4911)			6-Digit Code (Optional) 221113
Client to Site Relationship Owner/Operator			

FACILITY INFORMATION

Modification of Existing Facility				Yes	No		
1. Will this project modify an existing facility, system, or activity?				<input type="checkbox"/>	<input checked="" type="checkbox"/>		
2. Will this project involve an addition to an existing facility, system, or activity?				<input type="checkbox"/>	<input checked="" type="checkbox"/>		
If "Yes", check all relevant facility types and provide DEP facility identification numbers below.							
Facility Type	DEP Fac ID#	Facility Type	DEP Fac ID#				
<input type="checkbox"/> Air Emission Plant		<input type="checkbox"/> Industrial Minerals Mining Operation					
<input type="checkbox"/> Beneficial Use (water)		<input type="checkbox"/> Laboratory Location					
<input type="checkbox"/> Blasting Operation		<input type="checkbox"/> Land Recycling Cleanup Location					
<input type="checkbox"/> Captive Hazardous Waste Operation		<input type="checkbox"/> MineDrainageTrmt/LandRecyProjLocation					
<input type="checkbox"/> Coal Ash Beneficial Use Operation		<input type="checkbox"/> Municipal Waste Operation					
<input type="checkbox"/> Coal Mining Operation		<input type="checkbox"/> Oil & Gas Encroachment Location					
<input type="checkbox"/> Coal Pillar Location		<input type="checkbox"/> Oil & Gas Location					
<input type="checkbox"/> Commercial Hazardous Waste Operation		<input type="checkbox"/> Oil & Gas Water Poll Control Facility					
<input type="checkbox"/> Dam Location		<input type="checkbox"/> Public Water Supply System					
<input type="checkbox"/> Deep Mine Safety Operation -Anthracite		<input type="checkbox"/> Radiation Facility					
<input type="checkbox"/> Deep Mine Safety Operation -Bituminous		<input type="checkbox"/> Residual Waste Operation					
<input type="checkbox"/> Deep Mine Safety Operation -Ind Minerals		<input type="checkbox"/> Storage Tank Location					
<input type="checkbox"/> Encroachment Location (water, wetland)		<input type="checkbox"/> Water Pollution Control Facility					
<input type="checkbox"/> Erosion & Sediment Control Facility		<input type="checkbox"/> Water Resource					
<input type="checkbox"/> Explosive Storage Location		<input type="checkbox"/> Other:					
Latitude/Longitude Point of Origin		Latitude		Longitude			
		Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
Horizontal Accuracy Measure		Feet		--or--		Meters	
Horizontal Reference Datum Code		<input type="checkbox"/> North American Datum of 1927 <input type="checkbox"/> North American Datum of 1983 <input type="checkbox"/> World Geodetic System of 1984					
Horizontal Collection Method Code							
Reference Point Code							
Altitude		Feet		--or--		Meters	
Altitude Datum Name		<input type="checkbox"/> The National Geodetic Vertical Datum of 1929 <input type="checkbox"/> The North American Vertical Datum of 1988 (NAVD88)					
Altitude (Vertical) Location Datum Collection Method Code							
Geometric Type Code							
Data Collection Date							
Source Map Scale Number		Inch(es)		=		Feet	
		--or--		=		Meters	
		Centimeter(s)					

PROJECT INFORMATION

Project Name			
Project Description			
Project Consultant Last Name	First Name	MI	Suffix
Project Consultant Title		Consulting Firm	
Mailing Address Line 1		Mailing Address Line 2	
Address Last Line – City		State	ZIP+4

Phone

Ext

FAX

Email Address

Time Schedules	Project Milestone (Optional)

1. Is this application for an authorization type on the list of authorizations affected by the land use policy? ☐ Yes ☐ No

Note: If "Yes", you must complete the following Land Use Information section, unless exempted by Questions 2 or 3 below.

If "No", skip Questions 2 & 3 below as well as the following Land Use Information section.

For referenced list, see Appendix A attached to the GIF Instructions.

2. For an Air program authorization only. All other authorizations continue with Question 3 below. Will the permit authorize the construction of facilities outside an existing permitted area? ☐ Yes ☐ No

Note: If "Yes", you must complete the following Land Use Information section unless exempted by Question 3 below.

If "No", skip Question 3 below as well as the following Land Use Information section.

3. Have you attached or submitted municipal and county 'Early Opt Out' approval letters for the project? ☐ Yes ☐ No

Note: If "Yes" to Question 3, skip the following Land Use Information section. This should only be checked "Yes" if applicant is choosing the early opt-out option. Required approval letters described in the GIF Checklist and Instructions should be attached.

If "No" to Question 3, continue with the following Land Use Information section.

LAND USE INFORMATION

Note: Applicants are encouraged to submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

- | | | |
|--|------------------------------|-----------------------------|
| 1. Is there a municipal comprehensive plan(s)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. Is there a county comprehensive plan(s)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. Is there a multi-municipal or multi-county comprehensive plan? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. Is the proposed project consistent with these plans? If no plan(s) exists, answer "Yes". | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 5. Is there a municipal zoning ordinance(s)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 6. Is there a joint municipal zoning ordinance(s)? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 7. Will the proposed project require a zoning approval (e.g., special exception, conditional approval, re-zoning, variance)? If zoning approval has already been received, attach documentation. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8. Are any zoning ordinances that are applicable to this project currently the subject of any type of legal proceeding? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9. Will the project be located on a site that has been or is being remediated under DEP's Land Recycling Program? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 10. Will the project result in reclamation of abandoned mine lands through re-mining or as part of DEP's Reclaim PA Program? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 11. Will the project be located in an agricultural security area or an area protected under an agricultural conservation easement? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 12. Will the project be located in a Keystone Opportunity Zone or Enterprise Development Area? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 13. Will the project be located in a Designated Growth Area as defined by the Municipalities Planning Code? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 and the accompanying Cultural Resource Notice Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	Is this a coal mining project? If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0. (DEP Use/48y1)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.1	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day? (DEP Use/4x70)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.2	Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year? (DEP Use/4x70)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.3	Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used? (DEP Use/4x70)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.4	For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters? (DEP Use/4x62)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.5	Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet? (DEP Use/3140)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
1.6	Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well? (DEP Use/4z41)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.0	Is this a non-coal (industrial minerals) mining project? If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0. (DEP Use/48y1)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.1	Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel? (DEP Use/4x70)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.2	Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials? (DEP Use/4x70)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.3	Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)? (DEP Use/4x70)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.4	For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters? (DEP Use/4x62)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
2.5	Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet? (DEP Use/3140)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No

3.0	Will your project, activity, or authorization have anything to do with a well related to oil or gas production, site development for such activity, or the waste from such a well? If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0. (DEP Use/4z41)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
3.1	Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)? (DEP Use/4z41)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
3.2	Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system? If "Yes", discuss in <i>Project Description</i> . (DEP Use/4z41)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
3.3	Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities? (DEP Use/4z41)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
4.0	Will the project involve a construction activity that results in earth disturbance? If "Yes", specify the total disturbed acreage. (DEP Use/4x66)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
	4.0.1 Total Disturbed Acreage				
5.0	Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)? (DEP Use/4x66)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
6.0	Will the project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system? If "Yes", discuss in <i>Project Description</i> . (DEP Use/4x62)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
7.0	Will the project involve the construction and operation of industrial waste treatment facilities? (DEP Use/4x62)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
8.0	Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations? If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the <i>Project Description</i> , where applicable. (DEP Use/4x62)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
	8.0.1 Estimated Proposed Flow (gal/day)				
9.0	Was sewage planning submitted and approved? If "Yes", attach the Act 537 approval letter unless the submitted application is actually requesting Act 537 approval (Approval required prior to 105/NPDES approval). (DEP Use/4x61)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
	9.0.1 Is Act 537 Approval Letter attached?	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
10.0	Is this project for the beneficial use of biosolids for land application within Pennsylvania? If "Yes" indicate how much (i.e. gallons or dry tons per year). (DEP Use/4X62)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
	10.0.1 Gallons Per Year (residential septage)				
	10.0.2 Dry Tons Per Year (biosolids)				
11.0	Does the project involve construction, modification or removal of a dam? If "Yes", identify the dam. (DEP Use/3140)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
	11.0.1 Dam Name				
12.0	Will the project interfere with the flow from, or otherwise impact, a dam? If "Yes", identify the dam. (DEP Use/3140)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
	12.0.1 Dam Name				
13.0	Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)? If "Yes", identify each type of emission followed by the amount of that emission. (DEP Use/4x70)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
	13.0.1 Enter all types & amounts of emissions; separate each set with semicolons.				

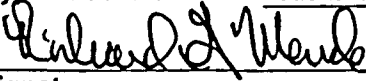
14.0	Is an on-site drinking water supply (well), other than individual house wells, proposed for your project? If "Yes", indicate total number of people served and/or the total number of connections served, if applicable. Also, check all proposed sub-facilities. (DEP Use/4x81)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.1	Number of Persons Served				
14.0.2	Number of Employee/Guests				
14.0.3	Number of Connections				
14.0.4	Sub-Fac: Distribution System	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.5	Sub-Fac: Water Treatment Plant	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.6	Sub-Fac: Source	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.7	Sub-Fac: Pump Station	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.8	Sub-Fac: Entry Point	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.9	Sub-Fac: Transmission Main	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
14.0.10	Sub-Fac: Storage Facility	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
15.0	Will your project involve purchasing water in bulk, excluding during the construction period? If "Yes", name the provider. Also, indicate the daily number of employees or guests served. (DEP Use/4x81)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
15.0.1	Provider's Name				
15.0.2	Number of Employees/Guests				
16.0	Is your project to be served by public water supply? If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project. (DEP Use/4x81)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
16.0.1	Supplier's Name				
16.0.2	Letter of Approval from Supplier is Attached	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
17.0	Will this project involve a new or increased drinking water withdrawal from a stream or other water body? If "Yes", provide name of stream. (DEP Use/4x81)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
17.0.1	Stream Name				
18.0	Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste? If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed. (DEP/Use4x32)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
18.0.1	Type & Amount				
19.0	Will your project involve the removal of coal, minerals, etc. as part of any earth disturbance activities? (DEP Use/48y1)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
20.0	Does your project involve installation of a field constructed underground storage tank? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
20.0.1	Enter all substances & capacity of each; separate each set with semicolons.				
21.0	Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
21.0.1	Enter all substances & capacity of each; separate each set with semicolons.				
22.0	Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724? If "Yes", list each Substance & its Capacity. Note: Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570)	<input type="checkbox"/>	Yes	<input type="checkbox"/>	No
22.0.1	Enter all substances & capacity of each; separate each set with semicolons.				

- 23.0 Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons? If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. (DEP Use/2570) ☐ Yes ☐ No
- 23.0.1 Enter all substances & capacity of each; separate each set with semicolons.

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

Type or Print Name Richard G. Mende



Signature

Director, Site Operations

Title

6-23-06

Date

Application



**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION**

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) APPLICATION FOR PERMIT TO DISCHARGE INDUSTRIAL WASTEWATER

Before completing this form, read the step-by-step instructions provided in this application package.

Related ID#s (If Known)		DEP USE ONLY
Client ID# _____	APS ID# _____	Date Received & General Notes
Site ID# _____	Auth ID# _____	
Facility ID# _____		

APPLICANT IDENTIFIER

Applicant/Operator Name FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

Is this an application for a:

☐ New permit

Complete the General Information Form (GIF) 8000-PM-IT0001 and attach to the front of the application.

☒ Permit Renewal

List the current NPDES Permit number PA0025615

Complete the Client and Site Sections of the GIF and attach to the front of the application.

☐ Permit Amendment or Permit Renewal with Amendment

List the current NPDES Permit number PA _____

List the current WQM Permit number _____

Complete the GIF and attach to the front of the application.

GENERAL INFORMATION

1. SIC Code	NAICS Code	Corresponding SIC/NAICS Description
4911	221113	Electric power, distribution and transmission.
2. Is the facility required to obtain a stormwater NPDES permit for any listed SIC code?		
<input checked="" type="checkbox"/> YES (Answer question 3 below.) <input type="checkbox"/> NO (Skip question 3.)		
3. Is the facility applying for permit exemption under the No Exposure rule? (See Instructions)		
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
4. General Description and Nature of Business.		
Two (2) unit, pressurized water reactor (PWR), nuclear power generating station.		
5. List all NPDES and WQM Permits issued by DEP for this facility.		
Permit Type	Permit Number	Date Issued
NPDES	PA 0025615	12/27/2001
*Various	*Various	*Various

* Will be furnished upon request.

6. ATTACH TOPOGRAPHIC MAP (See Instructions) Please see Attachment 1

7. NUMBER OF OUTFALLS

a. Industrial Wastewater Only	6	Complete Module 1 and associated Modules.
b. Combined Industrial Wastewater and Stormwater	4	Complete Module 1, associated Modules and Module 12 or Module 14 (if required).
c. Stormwater Only	7	Complete Module 12 or Module 14.

8. OUTFALL LOCATION: Using the same Locational Data supplied on the General Information Form under Facility Information, list the latitude and longitude of the location to the nearest ten-thousandth of a second and the name of the receiving water of each outfall. Where available, the receiving stream width and depth should also be provided using actual measurements or topographic map and navigational charts. Continued

OUTFALL NUMBER (list)	LATITUDE			LONGITUDE			RECEIVING WATER (Name)	LOW FLOW STREAM	
	Deg	Min	Sec	Deg	Min	Sec		Width (ft)	Depth (ft)
001	40	37	16	80	26	19	Ohio River		
002	40	37	26	80	26	07	Ohio River		
003	40	37	26	80	26	07	Ohio River		
004	40	37	30	80	26	02	Ohio River		
006	40	37	26	80	26	07	Ohio River		
007	40	37	26	80	26	07	Ohio River		
008	40	37	30	80	26	02	Ohio River		
010	40	37	16	80	26	21	Ohio River		
011	40	37	26	80	26	05	Ohio River		
012	40	37	38	80	25	70	Pegg's Run		
013	40	37	43	80	25	77	Pegg's Run		
014	40	37	43	80	25	78	Pegg's Run		
015	40	37	41	80	25	71	Pegg's Run		
016	40	37	36	80	25	66	Pegg's Run		
017	40	37	32	80	25	61	Pegg's Run		
018	40	37	29	80	26	22	Ohio River		
019	40	34	20	80	26	33	Ohio River		

9. Name of Nearest Downstream Potable Water Intake Midland Water Authority Distance 1.3 River miles

10. WHOLE EFFLUENT TOXICITY (WET) TEST RESULTS

Is there known or reason to believe that WET testing was conducted in the last 3 years on any of the facility's discharges, or on a receiving water in relation to a discharge? ☐ YES ☒ NO

If "YES," attach any information available on the purpose and nature of such testing, and the test results.

If "NO," all dischargers are still encouraged to perform WET testing. The DEP regional office may be contacted for appropriate protocols.

11. CONTRACTED ANALYTICAL ASSISTANCE

Did a contract laboratory or consulting firm perform any of the analysis required by this application?

☐ NO ☒ YES (Provide information below.)

Name	BETA Laboratory	Types of Analysis Performed: TSS, Bromide, Fluoride, Nitrate, Nitrite, Sulfate, Total Organic Carbon, COD, Ammonia, Total Phosphorous, Total Metals, Hexavalent Chromium, Dissolved iron, Sulfite, Oil and Grease, pH, Temperature, TRC
Address	6670 BETA Drive Mayfield Village, Ohio 44213	
Phone	(440) 604-9875	
Name	EA Group	Types of Analysis Performed: Total Sulfides, BOD-5, Color, MBAS, Total Kjeldahl Nitrogen, Total and Free Cyanide, Phenol, Base/Neutral Acids, Volatile Organic Compounds, Total Organic Carbon
Address	7118 Industrial Park Blvd Mentor, Ohio 44060-5314	
Phone	(440) 951-3514	
Name	CMA Environmental Lab	Types of Analysis Performed: Fecal Coliform
Address	265 College Avenue Beaver, PA 1500	
Phone	(724) 728-5539	
Name	Environmental, Inc. - Midwest laboratory	Types of Analysis Performed: Total Alpha, Total Beta, Total Radium
Address	700 Landwehr Road Northbrook, IL 60062-2310	
Phone	(847) 564-0700	

12. ADDITIONAL INFORMATION: (OPTIONAL)

Additional information may be attached to expand upon any response to any questions or call attention to any other information felt should be considered in establishing permit limitations for the proposed or existing facility. Check if additional sheets are attached.

☒ YES ☐ NO

Please see letter titled "Preliminary Issues Regarding Renewal of NPDES Permit PA0025615"

COMPLIANCE HISTORY REVIEW

Is the facility owner or operator in violation of any DEP regulation, permit, order or schedule of compliance at this or any other facility? ☐ YES ☒ NO

If "YES," list each permit, order and schedule of compliance and provide compliance status. Use additional sheets to provide information on all permits.

Permit Program _____ Permit No. _____

Brief Description of Noncompliance _____

Steps Taken to Achieve Compliance	Date(s) Compliance Achieved

Current Compliance Status ☐ In Compliance ☐ In Noncompliance

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Richard G. Mende

Director, Site Operations

Name (type or print legibly)

Official Title

Richard G. Mende

6/23/06

Signature

Date

(Use corporate or professional seal as appropriate.)

Taken, sworn, and subscribed before me, this 23 day of June 2006

Notary Seal

Marianne Spanik

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Marianne Spanik, Notary Public
Shippingport Boro, Beaver County
My Commission Expires May 14, 2009
Member, Pennsylvania Association of Notaries



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**APPLICATION FOR NPDES PERMIT
FOR INDUSTRIAL DISCHARGERS**

APPLICANT'S ✓ CHECKLIST

APPLICANT NAME

**FirstEnergy Nuclear Operating Company (FENCO) - Beaver Valley Power
Station**

Please check the following list to make sure that you have included all the required information. Place a checkmark in the column provided for all items completed and/or provided.

Failure to provide all of the requested information will delay the processing of the application and may result in the application being placed on hold with no action, or will be considered withdrawn and the application file closed.

	Item	Check If Included	DEP Use Only
1.	General Information Form (8000-PM-IT0001)	<input checked="" type="checkbox"/>	
2.	One original and (2) copies of application package submitted [original must be notarized]	<input checked="" type="checkbox"/>	
3.	Additional copy for Erie and Allegheny counties (if required)	<input type="checkbox"/>	
4.	Additional copy for the river basin commission (if required)	<input type="checkbox"/>	
5.	Application Fee - \$500	<input checked="" type="checkbox"/>	
6.	Proper evidence of Act 14 municipality and county notification	<input checked="" type="checkbox"/>	
7.	Proof of local newspaper public notice (for new and substantially changed discharges only)	<input type="checkbox"/>	
8.	Topographic Map	<input checked="" type="checkbox"/>	
9.	Industrial Wastewater - Module 1	<input checked="" type="checkbox"/>	
10.	Wastewater Treatment Technologies - Module 2	<input checked="" type="checkbox"/>	
11.	Sources Of Wastewater sheet(s) - Module 3	<input checked="" type="checkbox"/>	
12.	Analysis Results Table(s) - Modules 4-9	<input checked="" type="checkbox"/>	
13.	Hazardous Substance Table - Module 10	<input checked="" type="checkbox"/>	
14.	Toxic Chemicals (Optional) - Module 11	<input type="checkbox"/>	
15.	Stormwater (if required) - Module 12	<input checked="" type="checkbox"/>	
16.	Stormwater Sampling Data Table (if required) - Module 13*	<input type="checkbox"/>	
17.	No Exposure Certification (if required) - Module 14	<input type="checkbox"/>	
18.	Other:	<input type="checkbox"/>	

* The data for Module 13 will follow this application. Collection and analysis are occurring presently.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**INDUSTRIAL WASTEWATER
MODULE 1**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

1. Line Drawing. Attach a line drawing and water balance of flow through the facility. (See instructions)

Please see Attachment 2: Waste Water Flow Diagram (RM-0027F, Revision 14)

2. OUTFALLS AND ASSOCIATED WASTEWATER TREATMENT TECHNOLOGIES

Complete Module 2 identifying the treatment processes associated with each outfall.

3. SOURCES OF WASTEWATER

Attach a separate Module 3 for every outfall.

Indicate the number of Module 3s attached.

11

4. REQUIRED AND OPTIONAL ANALYSIS

a. Summary of Required Analysis

Outfall Number	Discharge Contains (see Instructions)						Pollutants or Pollutant Groups which must be sampled for and analyzed	Required Number of Sample Events (see instructions)
	Process Waste	NCCW	Sanitary Waste	Misc. Waste	GW Cleanup	Stormwater		
IMP 101	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2, 3, 4, 5	3
IMP 301	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2	3
IMP 401	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2	3
001	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2, 3, 4, 5	3
IMP 102	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2, 3, 4, 5	1
002	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
IMP 103	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2, 3, 4, 5	3
IMP 203	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Group 1	1
IMP 303	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2, 3, 4, 5	3
IMP 403	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1 & 5M	1
003	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
004	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
006	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
007	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
008	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
010	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1 & 5M	1
IMP 111	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2, 3, 4, 5	3
IMP 211	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2, 3, 4, 5	3
011	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
012	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
IMP 113	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Group 1	1
IMP 313	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Groups 1, 2, 3, 4, 5	3

IMP 413	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Groups 1, 2, 3, 4, 5	1
013	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
014	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
016	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
017	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
018	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

b. Complete the modules for the Pollutant(s) or Pollutant Group(s) identified above. A separate module must be submitted for each process wastewater and combined (process wastewater and stormwater) outfall identified in the application. List the number of modules for each Pollutant Group submitted with this application.

22	Module 4 - Pollutant Group 1
20	Module 5 - Pollutant Group 2 - Metals
15	Module 6 - Pollutant Group 3 - Volatile
15	Module 7 - Pollutant Group 4 - Acids
15	Module 8 - Pollutant Group 5 - Base/Neutral
0	Module 9 - Pollutant Group 6 - Pesticides

c. Optional Site-Specific Data

Additional modules may be attached to provide any of the optional site-specific information discussed in Appendix 2. (The modules should be used to report intake water quality, upstream background or ambient water quality, and parameter-specific coefficient of effluent variability. Space is provided at the top of the module to provide description of sampling points used.)

Optional data is attached to application.

☒ YES ☐ NO

5. PREPAREDNESS, PREVENTION, AND CONTINGENCY (PPC) PLANNING.

Does the facility have a PPC plan?

☒ YES ☐ NO

Does the facility have any other related plans, such as a Pollution Incident Prevention (PIP) Plan, Spill Prevention Control and Counter Measure (SPCC) Plan or BMP Plan?

☒ YES ☐ NO

If "YES," identify and indicate date(s) implemented.

Type of Plan

Date Implemented

FirstEnergy Nuclear Operating Company (FENOC), Beaver Valley Power Station, Environmental Emergency Response Plan

December 2005

DEP may require the plan(s) be submitted with this application.

6. OTHER INFORMATION (OPTIONAL): Attach additional sheets describing any additional environmental pollution control programs which may affect the discharges which are underway or which are planned. Indicate whether each program is now underway or planned, and indicate the actual or planned schedules.

☐ MARK "X" IF DESCRIPTION OF ADDITIONAL INFORMATION IS ATTACHED

7. INFORMATION AND ANALYSIS OF EFFLUENT QUALITY FOR OTHER POTENTIALLY TOXIC POLLUTANTS

a. Information on Chemical Additives Please see Attachment 3 - Chemical Additives List, Revision 10

(Read instructions carefully and use the tabular format to present the required information)

[illegible]

(1) If LC50 Data for whole product is not available, data for the individual active ingredients may be provided.

(Read instructions carefully and use the tabular format and additional pages, where necessary, to present the required information)

[illegible]

☐ YES ☐ NO

d. Any other toxic chemicals known or expected to be present in the discharge.

Report any additional significant detections in effluent samples on the Other Toxic Chemicals sheets.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

WASTEWATER TREATMENT TECHNOLOGIES
MODULE 2

APPLICANT NAME		FirstEnergy Nuclear Operating Company (FENOC)- Beaver Valley Power Station
Outfall Number	Treatment Unit Description (list in sequence)	Method for Handling and Disposal of Solid or Liquid Residue Resulting from Treatment (list in sequence)
001	Screening Disinfection (Chlorine) Disinfection (Other) Dechlorination Sedimentation Neutralization Evaporation Ion Exchange Foam Fractionation	Land Application N/A N/A N/A Land Application N/A N/A N/A N/A
002	Screening	Land Application
003	Flocculation Coagulation Sedimentation Slow Sand Filtration Reverse Osmosis Ion Exchange Grinding Pre-Aeration Rotating Biological Contactor Disinfection (chlorine) Oil and Grease Removal Neutralization	N/A N/A Landfill N/A N/A N/A N/A N/A N/A N/A Incineration N/A
004	Screening Foam Fractionation	Land Application N/A
006	Screening	Land Application
007	Screening Disinfection (Other)	Land Application N/A
008	None	
010	Screening Disinfection (Other) Foam Fractionation	Land Application N/A N/A
011	Oil and Grease Removal Ion Exchange	Incineration N/A

012	None	
013	Oil and Grease Removal Grinding Pre-Aeration Rotation Biological Contactor Disinfection (Chlorine) Sedimentation Oil and Grease Removal	Incineration N/A N/A N/A N/A Land Application Incineration
014	None	
015	None	
016	None	
017	None	
018	None	
019	None	



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: FirstEnergy Nuclear Operating
Company (FENOC) - Beaver Valley Power Station
Outfall: 001

**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station		
OUTFALL NUMBER	001 - Unit #1 and Unit #2 cooling tower blowdown, sources previously monitored at 101, 301, and 401, treated rad waste and occasional clarified overflow		
1. Process Wastewater			
a. Describe process and type of wastewater. Unit 1 Cooling Tower Blowdown			
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.			
c. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr. During which months? <u>All</u>			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			<u>36.0</u> MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			<u>19.9</u> MGD
For batch discharges report:			
Number of decant cycles.			_____ Cycles/day
Length of each decant cycle.			_____ MIN.
Average decant discharge rate.			_____ GPM

Process Wastewater

a. Describe process and type of wastewater.

Unit 2 Cooling Tower Blowdown

b. Production Rate.

Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.

c. Discharge Occurs. 24 hrs/day; 7 days/wk; 365 days/yr; 12 months/yr.
During which months? All

Report the discharge rate as:

The maximum daily discharge rate. 25.2 MGD
The monthly average discharge rate. MGD
The long-term average discharge rate. 15.3 MGD

For batch discharges report:

Number of decant cycles. Cycles/day
Length of each decant cycle. MIN.
Average decant discharge rate. GPM

Process Wastewater

a. Describe process and type of wastewater.

Internal Monitoring Point 101

Unit 1 chemical waste sump receiving wastewater from lab sink drains, secondary system process analyzer drains, container rinsates, condensate and steam generator drains; Unit 1 water treating chemical storage area floor drains, elementary neutralization and air compressor condensation.

b. Production Rate.

Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.

c. Discharge Occurs. 1 hrs/day; 3 days/wk; 156 days/yr; 12 months/yr.
During which months? All

Report the discharge rate as:

The maximum daily discharge rate. 0.252 MGD
The monthly average discharge rate. MGD
The long-term average discharge rate. 0.003 MGD

For batch discharges report:

Number of decant cycles. Cycles/day
Length of each decant cycle. MIN.
Average decant discharge rate. GPM

-3-

Process Wastewater	
a. Describe process and type of wastewater. Unit 1 Treated Radioactive Liquid Waste	
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.	
c. Discharge Occurs. <u>12</u> hrs/day; <u>1</u> days/wk; <u>24</u> days/yr; <u>12</u> months/yr. During which months? All	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.050</u> MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	<u>0.004</u> MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM
Process Wastewater	
a. Describe process and type of wastewater. Unit 2 Treated Radioactive Liquid Waste	
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.	
c. Discharge Occurs. <u>12</u> hrs/day; <u>1</u> days/wk; <u>60</u> days/yr; <u>12</u> months/yr. During which months? All	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.072</u> MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	<u>0.018</u> MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM

Process Wastewater	
a.	Describe process and type of wastewater. Unit 2 cooling tower pumphouse pump seal water leak off (discharged to the Unit 2 cooling tower basin and recycled)
b.	Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.
c.	Discharge Occurs. <u>1</u> hrs/day; <u>1</u> days/wk; <u>52</u> days/yr; <u>12</u> months/yr. During which months? All
Report the discharge rate as:	
	The <u>maximum daily</u> discharge rate. _____ MGD
	The <u>monthly average</u> discharge rate. _____ MGD
	The <u>long-term average</u> discharge rate. _____ MGD
For batch discharges report:	
	Number of decant cycles. _____ Cycles/day
	Length of each decant cycle. _____ MIN.
	Average decant discharge rate. _____ GPM
Process Wastewater	
a.	Describe process and type of wastewater. Unit 2 Turbine Building chemical process-vessel area sump (discharged to the Unit 2 cooling tower basin and recycled).
b.	Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.
c.	Discharge Occurs. <u>1</u> hrs/day; <u>1</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr. During which months? All
Report the discharge rate as:	
	The <u>maximum daily</u> discharge rate. _____ MGD
	The <u>monthly average</u> discharge rate. _____ MGD
	The <u>long-term average</u> discharge rate. _____ MGD
For batch discharges report:	
	Number of decant cycles. _____ Cycles/day
	Length of each decant cycle. _____ MIN.
	Average decant discharge rate. _____ GPM

Process Wastewater

- a. Describe process and type of wastewater.

Circulating Water Vent – "Gooseneck"

Unit 2 condensate and steam generator drains, non-contact cooling water from Unit 2 secondary side heat exchangers and chillers during maintenance activities, waste water from condenser and heat exchanger river-water-side cleaning (water-only wash), circulating water drains.

- b. Production Rate.

Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.

- c. Discharge Occurs. 4 hrs/day; 3 days/wk; 30 days/yr; 12 months/yr.

During which months? All, normally during plant refueling and maintenance outages

Report the discharge rate as:

The maximum daily discharge rate. 0.250 MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. 0.045 MGD

For batch discharges report:

Number of decant cycles. _____ Cycles/day

Length of each decant cycle. _____ MIN.

Average decant discharge rate. _____ GPM

2. All Other Wastewater Contributing to this Outfall			
a. Describe the wastewater. Unit 1 & Unit 2 primary and secondary closed loop cooling water			
b. Source(s). Infrequent leakage of closed loop cooling water into river and service water system. Infrequently, components may be drained and passed through and ion exchanger prior to discharge to Outfall 001.			
c. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>30</u> days/yr; <u>12</u> months/yr. During which months? All, infrequent if/when equipment failure exists			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			_____ MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			_____ MGD
For batch discharges report:			
Number of decant cycles.			_____ Cycles/day
Length of each decant cycle.			_____ MIN.
Average decant discharge rate.			_____ GPM
3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater			
a. Source(s). Unit 1&2 Cooling Tower Blowdown, Unit 1&2 Treated Radioactive Liquid Waste, Internal Monitoring Points 301 and 401, Circulating Water Gooseneck, Unit 2 Pumphouse pump seal leak off, Unit 2 chemical sump, and infrequent closed loop cooling water			
b. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr. During which months? All			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			<u>61.8</u> MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			<u>35.3</u> MGD
4. Stormwater			
Complete Module 12 or Module 14 for the stormwater contribution.			



COMMONWEALTH OF PENNSYLVANIA
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**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station		
OUTFALL NUMBER	002 - Intake screen backwash, pump bearing leakage from 102 and decanted river water		
1. Process Wastewater			
a. Describe process and type of wastewater.			
Intake Screen Backwash			
b. Production Rate.			
Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.			
c. Discharge Occurs.	<u>1</u>	hrs/day; <u>1</u>	days/wk; <u>12</u> days/yr; <u>12</u> months/yr.
During which months? <u>All</u>			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			<u>0.092</u> MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			<u>0.046</u> MGD
For batch discharges report:			
Number of decant cycles..			_____ Cycles/day
Length of each decant cycle.			_____ MIN.
Average decant discharge rate.			_____ GPM

Process Wastewater	
a. Describe process and type of wastewater. Internal Monitoring Point 102 Intake screenhouse (pump bearing cooling water leakage) and once through river water.	
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.	
c. Discharge Occurs. <u>1</u> hrs/day; <u>1</u> days/wk; <u>52</u> days/yr; <u>12</u> months/yr. During which months? All	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.002</u> MGD
The <u>monthly average</u> discharge rate.	<u> </u> MGD
The <u>long-term average</u> discharge rate.	<u>0.001</u> MGD
For batch discharges report:	
Number of decant cycles.	<u> </u> Cycles/day
Length of each decant cycle.	<u> </u> MIN.
Average decant discharge rate.	<u> </u> GPM

2. All Other Wastewater Contributing to this Outfall	
a. Describe the wastewater. Intake Bay Dewatering	
b. Source(s). Decanted uncontaminated river water from intake bay prior to maintenance and bay cleaning activities.	
c. Discharge Occurs. <u>2</u> hrs/day; <u>1</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr. During which months? All, intermittent depending upon siltation levels: Nuclear Safety Condition	
Report the discharge rate as: -	
The <u>maximum daily</u> discharge rate.	<u>0.500</u> MGD
The <u>monthly average</u> discharge rate.	<u> </u> MGD
The <u>long-term average</u> discharge rate.	<u>0.200</u> MGD
For batch discharges report:	
Number of decant cycles.	<u> </u> Cycles/day
Length of each decant cycle.	<u> </u> MIN.
Average decant discharge rate.	<u> </u> GPM
3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater	
a. Source(s). Intake screen backwash, intake river water pump seal water leak off, intake bay decanting, fire protection water	
b. Discharge Occurs. <u>4</u> hrs/day; <u>3</u> days/wk; <u>76</u> days/yr; <u>12</u> months/yr. During which months? All	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.594</u> MGD
The <u>monthly average</u> discharge rate.	<u> </u> MGD
The <u>long-term average</u> discharge rate.	<u>0.247</u> MGD
4. Stormwater	
Complete Module 12 or Module 14 for the stormwater contribution.	



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**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.	
APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
OUTFALL NUMBER	003 - Uncontaminated yard stormwater runoff, deionized water storage tank drainage, intermittent noncontact cooling water leakage/drainage, and those sources monitored at 103, 203, 303, and 403
1. Process Wastewater	
<p>a. Describe process and type of wastewater.</p> <p>Internal Monitoring Point 103</p> <p>Clarifier settling basin receiving wastewater from clarifier blowdown, water treating filter backwash, make-up water (Ecolochem) reverse osmosis reject water, non-contact cooling water.</p>	
<p>b. Production Rate.</p> <p>Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.</p>	
<p>c. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr.</p> <p>During which months? <u>All</u></p>	
<p>Report the discharge rate as:</p> <p>The <u>maximum daily</u> discharge rate. <u>0.330</u> MGD</p> <p>The <u>monthly average</u> discharge rate. <u> </u> MGD</p> <p>The <u>long-term average</u> discharge rate. <u>0.119</u> MGD</p>	
<p>For batch discharges report:</p> <p>Number of decant cycles. <u> </u> Cycles/day</p> <p>Length of each decant cycle. <u> </u> MIN.</p> <p>Average decant discharge rate. <u> </u> GPM</p>	

Process Wastewater							
<p>a. Describe process and type of wastewater.</p> <p>Internal Monitoring Point 303</p> <p>Unit 1 oil/water separator receiving wastewater from Unit 1 turbine building floor drains. Circulating water, non-contact cooling water heat exchanger, and condensate equipment leakage and maintenance drains. Waste water from condenser and heat exchanger cleaning (water-only wash), circulating waste water drains from secondary side heat exchangers and chillers, floor-mopping (water only) wastes.</p>							
<p>b. Production Rate.</p> <p>Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.</p>							
<p>c. Discharge Occurs. <u>8</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr.</p> <p style="text-align: center;">During which months? All</p>							
<p>Report the discharge rate as:</p> <table style="width: 100%;"> <tr> <td style="width: 80%;">The <u>maximum daily</u> discharge rate.</td> <td style="text-align: right;"><u>0.115</u> MGD</td> </tr> <tr> <td>The <u>monthly average</u> discharge rate.</td> <td style="text-align: right;">_____ MGD</td> </tr> <tr> <td>The <u>long-term average</u> discharge rate.</td> <td style="text-align: right;"><u>0.019</u> MGD</td> </tr> </table>		The <u>maximum daily</u> discharge rate.	<u>0.115</u> MGD	The <u>monthly average</u> discharge rate.	_____ MGD	The <u>long-term average</u> discharge rate.	<u>0.019</u> MGD
The <u>maximum daily</u> discharge rate.	<u>0.115</u> MGD						
The <u>monthly average</u> discharge rate.	_____ MGD						
The <u>long-term average</u> discharge rate.	<u>0.019</u> MGD						
<p>For batch discharges report:</p> <table style="width: 100%;"> <tr> <td style="width: 80%;">Number of decant cycles.</td> <td style="text-align: right;">_____ Cycles/day</td> </tr> <tr> <td>Length of each decant cycle.</td> <td style="text-align: right;">_____ MIN.</td> </tr> <tr> <td>Average decant discharge rate.</td> <td style="text-align: right;">_____ GPM</td> </tr> </table>		Number of decant cycles.	_____ Cycles/day	Length of each decant cycle.	_____ MIN.	Average decant discharge rate.	_____ GPM
Number of decant cycles.	_____ Cycles/day						
Length of each decant cycle.	_____ MIN.						
Average decant discharge rate.	_____ GPM						

Process Wastewater	
a. Describe process and type of wastewater.	
Internal Monitoring Point 403	
Intermittent Discharge - Unit 1 SW Circ Water Pit receiving wastewater from condensate and steam generator drains, auxiliary steam condensate, non-contact cooling water from secondary side heat exchanger and chiller maintenance drains, waste water from condenser and heat exchanger (river-water-side) cleaning (water-only wash), circulating water drains, and floor-mopping (water only) waste.	
b. Production Rate.	
Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.	
c. Discharge Occurs.	4 hrs/day; 2 days/wk; 12 days/yr; 12 months/yr.
	During which months? Discharge can occur during all months but is intermittent, normally only during refueling outages
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	0.015 MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	0.001 MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM

Process Wastewater	
a. Describe process and type of wastewater. Initial Monitoring Point 503 Noncontact cooling water from the emergency diesel generator heat exchanger	
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.	
c. Discharge Occurs. <u>12</u> hrs/day; <u>1</u> days/wk; <u>104</u> days/yr; <u>12</u> months/yr. During which months? All	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.504</u> MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	<u>0.252</u> MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM

2. All Other Wastewater Contributing to this Outfall	
a. Describe the wastewater. Demineralized Water Storage Tank Drains	
b. Source(s). Deionized water storage tank drainage and turbine plant deionized water storage tank overflow.	
c. Discharge Occurs. <u>1</u> hrs/day; <u>1</u> days/wk; <u>26</u> days/yr; <u>12</u> months/yr. During which months? All, normally during plant refueling outages.	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	_____ MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	_____ MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM
All Other Wastewater Contributing to this Outfall	
a. Describe the wastewater. Internal Monitoring Point 203 Unit 1 Sewage Treatment Plant	
b. Source(s). Unit 1 sanitary facilities	
c. Discharge Occurs. <u>12</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr. During which months? All	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.022</u> MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	<u>0.014</u> MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM

All Other Wastewater Contributing to this Outfall			
a. Describe the wastewater. Intermittent noncontact cooling water leakage/drainage			
b. Source(s). Unit 1 sanitary facilities			
c. Discharge Occurs: <u>24</u> hrs/day; <u>7</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr.			
		During which months?	All, infrequent if/when equipment failure exists
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			_____ MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			_____ MGD
For batch discharges report:			
Number of decant cycles.			_____ Cycles/day
Length of each decant cycle.			_____ MIN.
Average decant discharge rate.			_____ GPM
All Other Wastewater Contributing to this Outfall			
a. Describe the wastewater. Intermittent Exciter and Circulating Water Air Vent Valves leakage/drainage			
d. Source(s). Unit 1 sanitary facilities			
e. Discharge Occurs: <u>24</u> hrs/day; <u>7</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr.			
		During which months?	All, infrequent if/when equipment failure exists
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			_____ MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			_____ MGD
For batch discharges report:			
Number of decant cycles.			_____ Cycles/day
Length of each decant cycle.			_____ MIN.
Average decant discharge rate.			_____ GPM

f. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater	
a. Source(s). Internal Monitoring Points 103, 303, 403 and 503, intermittent non-contact cooling water leakage/drainage, Unit 1 Sewage Treatment plant (203), demineralized water storage tanks, intermittent non contact cooling water leakage/drainage and stormwater runoff.	
b. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr. During which months? <u>All</u>	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>1.193</u> MGD
The <u>monthly average</u> discharge rate.	<u> </u> MGD
The <u>long-term average</u> discharge rate.	<u>0.405</u> MGD
4. Stormwater	
Complete Module 12 or Module 14 for the stormwater contribution.	



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: FirstEnergy Nuclear Operating
Company (FENOC) - Beaver Valley Power Station
Outfall: 004

SOURCES OF WASTEWATER
MODULE 3

Before completing this form, read the step-by-step instructions provided in Appendix 1.	
APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
OUTFALL NUMBER	004 - Unit #1 cooling tower overflow
1. Process Wastewater	
a. Describe process and type of wastewater. Unit 1 Cooling Tower Overflow	
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.	
c. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>12</u> days/yr; <u>4</u> months/yr. During which months? June through October; smaller discharges may occur in other months.	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>7.7</u> MGD
The <u>monthly average</u> discharge rate.	____ MGD
The <u>long-term average</u> discharge rate.	<u>2.8</u> MGD
For batch discharges report:	
Number of decant cycles.	____ Cycles/day
Length of each decant cycle.	____ MIN.
Average decant discharge rate.	____ GPM

2. All Other Wastewater Contributing to this Outfall

a. Describe the wastewater.

Primary and secondary side closed loop cooling water, non-contact cooling water

b. Source(s). Infrequent leakage of closed loop cooling water into river and service water system.

c. Discharge Occurs. 24 hrs/day; 7 days/wk; 30 days/yr; 12 months/yr.

During which months? All, infrequent if/when equipment failure exists

Report the discharge rate as:

The maximum daily discharge rate. _____ MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. _____ MGD

For batch discharges report:

Number of decant cycles. _____ Cycles/day

Length of each decant cycle. _____ MIN.

Average decant discharge rate. _____ GPM

3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater

a. Source(s). Unit 1 Cooling Tower Overflow and infrequent closed loop cooling water leakage

b. Discharge Occurs. 24 hrs/day; 7 days/wk; 365 days/yr; 12 months/yr.

During which months? June through October; smaller discharges may occur in other months.

Report the discharge rate as:

The maximum daily discharge rate. 7.7 MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. 2.8 MGD

4. Stormwater

Complete Module 12 or Module 14 for the stormwater contribution.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: FirstEnergy Nuclear Operating
Company (FENOC) - Beaver Valley Power Station
Outfall: 006

**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station		
OUTFALL NUMBER	006 - Auxiliary intake screen backwash water and decanted river water		
1. Process Wastewater			
a. Describe process and type of wastewater. Auxiliary Intake Screen Backwash			
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.			
c. Discharge Occurs. <u>1</u> hrs/day; <u>1</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr. During which months? <u>All</u>			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			<u>0.072</u> MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			<u>0.018</u> MGD
For batch discharges report:			
Number of decant cycles.			_____ Cycles/day
Length of each decant cycle.			_____ MIN.
Average decant discharge rate.			_____ GPM

2. All Other Wastewater Contributing to this Outfall

a. Describe the wastewater.

Intake Bay Dewatering

b. Source(s). Decanted uncontaminated river water from intake bay prior to maintenance and bay cleaning activities.

c. Discharge Occurs. 2 hrs/day; 1 days/wk; 12 days/yr; 12 months/yr.

During which months?

Potentially all, intermittent depending upon
siltation level: Nuclear Safety Condition

Report the discharge rate as:

The maximum daily discharge rate. 0.500 MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. 0.200 MGD

For batch discharges report:

Number of decant cycles. _____ Cycles/day

Length of each decant cycle. _____ MIN.

Average decant discharge rate. _____ GPM

3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater

a. Source(s). Auxiliary Intake Screen Backwash; decanted river water, fire protection water.

b. Discharge Occurs. 1 hrs/day; 1 days/wk; 12 days/yr; 12 months/yr.

During which months?

All

Report the discharge rate as:

The maximum daily discharge rate. 0.572 MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. 0.018 MGD

4. Stormwater

Complete Module 12 or Module 14 for the stormwater contribution.



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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.	
APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
OUTFALL NUMBER	007 - Auxiliary intake system testing water and periodic discharge from Unit #1 and Unit #2 once through cooling water from heat exchangers and closed loop cooling water leakage
1. Process Wastewater	
a. Describe process and type of wastewater. Auxiliary intake river water pump testing water	
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.	
c. Discharge Occurs. <u>0.5</u> hrs/day; <u>1</u> days/wk; <u>8</u> days/yr; <u>12</u> months/yr. During which months? <u>All</u>	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.27</u> MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	<u>0.27</u> MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM

Process Wastewater

a. Describe process and type of wastewater.

Non-Contact cooling water from Unit 1 primary heat exchangers whenever Unit 1 & Unit 2 cooling tower blowdown is isolated.

b. Production Rate.

Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.

c. Discharge Occurs. 24 hrs/day; 7 days/wk; 14 days/yr; 1 months/yr.

During which months? All, infrequent only during refueling outages.

Report the discharge rate as:

The maximum daily discharge rate. 9.6 MGD

The monthly average discharge rate. MGD

The long-term average discharge rate. 9.1 MGD

For batch discharges report:

Number of decant cycles. Cycles/day

Length of each decant cycle. MIN.

Average decant discharge rate. GPM

2. All Other Wastewater Contributing to this Outfall

a. Describe the wastewater.

b. Source(s).

c. Discharge Occurs. _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.

During which months?

Report the discharge rate as:

The maximum daily discharge rate. _____ MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. _____ MGD

For batch discharges report:

Number of decant cycles. _____ Cycles/day

Length of each decant cycle. _____ MIN.

Average decant discharge rate. _____ GPM

3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater

a. Source(s). Auxiliary Intake and non-contact cooling water from Unit 1 primary heat exchangers when Unit 1 and Unit 2 blowdown is isolated.

b. Discharge Occurs. 24 hrs/day; 7 days/wk; 22 days/yr; 12 months/yr.

During which months?

June through October; smaller discharges may occur in other months

Report the discharge rate as:

The maximum daily discharge rate. 9.6 MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. 9.1 MGD

4. Stormwater

Complete Module 12 or Module 14 for the stormwater contribution.



Applicant Name: FirstEnergy Nuclear Operating
Company (FENOC) - Beaver Valley Power Station
Outfall: 008

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.	
APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
OUTFALL NUMBER	008 - Intermittent outage cooling tower blowdown and stormwater runoff
1. Process Wastewater	
a. Describe process and type of wastewater. Unit 1 circulating water drainage during refueling outages	
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.	
c. Discharge Occurs. <u>1</u> hrs/day; <u>7</u> days/wk; <u>28</u> days/yr; <u>1</u> months/yr. During which months? <u>All, Infrequent only during refueling outages</u>	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.216</u> MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	<u>0.001</u> MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM

2. All Other Wastewater Contributing to this Outfall	
a. Describe the wastewater.	
b. Source(s).	
c. Discharge Occurs. _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr. During which months?	
Report the discharge rate as: The <u>maximum daily</u> discharge rate. _____ MGD The <u>monthly average</u> discharge rate. _____ MGD The <u>long-term average</u> discharge rate. _____ MGD	
For batch discharges report: Number of decant cycles. _____ Cycles/day Length of each decant cycle. _____ MIN. Average decant discharge rate. _____ GPM	
3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater	
a. Source(s). Unit 1 circulating water drainage during refueling outages and stormwater runoff	
b. Discharge Occurs. <u>1</u> hrs/day; <u>7</u> days/wk; <u>28</u> days/yr; <u>1</u> months/yr. During which months? <u>All, Infrequent only during refueling outages</u>	
Report the discharge rate as: The <u>maximum daily</u> discharge rate. <u>0.216</u> MGD The <u>monthly average</u> discharge rate. _____ MGD The <u>long-term average</u> discharge rate. <u>0.001</u> MGD	
4. Stormwater Complete Module 12 or Module 14 for the stormwater contribution.	

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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station		
OUTFALL NUMBER	010 - Once-through cooling water from Unit #2 heat exchangers and closed loop cooling water leakage		
1. Process Wastewater			
a. Describe process and type of wastewater. Non-Contact Cooling Water from the Unit 2 primary heat exchangers			
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.			
c. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr. During which months? <u>All</u>			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			<u> </u> MGD
The <u>monthly average</u> discharge rate.			<u>3.63</u> MGD
The <u>long-term average</u> discharge rate.			<u> </u> MGD
For batch discharges report:			
Number of decant cycles.			<u> </u> Cycles/day
Length of each decant cycle.			<u> </u> MIN.
Average decant discharge rate.			<u> </u> GPM

2. All Other Wastewater Contributing to this Outfall	
a. Describe the wastewater. <u>Close loop cooling water leakage</u>	
b. Source(s). <u>Infrequent leakage of closed loop cooling water into river and service water system.</u>	
c. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr. During which months? <u>All, infrequent if/when equipment failure exists</u>	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	_____ MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	_____ MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM
3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater	
a. Source(s). <u>Non-Contact Cooling Water from the Unit 2 primary heat exchangers and infrequent closed loop cooling water.</u>	
b. Discharge Occurs. <u>24</u> hrs/day; <u>7</u> days/wk; <u>22</u> days/yr; <u>12</u> months/yr. During which months? <u>All</u>	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>3.63</u> MGD
The <u>monthly average</u> discharge rate.	<u>3.63</u> MGD
The <u>long-term average</u> discharge rate.	_____ MGD
4. Stormwater	
Complete Module 12 or Module 14 for the stormwater contribution.	



Applicant Name: FirstEnergy Nuclear Operating
Company (FENOC) - Beaver Valley Power Station
Outfall: 011

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station		
OUTFALL NUMBER	011 - Diesel generator building oil/water separator drain (OWS #22), turbine building oil/water separator drain (OWS #23), storm water runoff, deionized water storage tank drainage and intermittent noncontact cooling water leakage/drainage and other occasional, intermittent flows		
1. Process Wastewater			
a. Describe process and type of wastewater. Internal Monitoring Point 111 Oil/Water Separator 22 receiving wastewater from Unit 2 diesel generator and turbine plant floor drains. Circulating water, service water (river water), noncontact cooling water and condensate leakage and drains during maintenance activities. Floor-mopping (water only) wastes.			
b. Production Rate. Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.			
c. Discharge Occurs. <u>2</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr. During which months? <u>All</u>			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.		<u>0.004</u>	MGD
The <u>monthly average</u> discharge rate.		_____	MGD
The <u>long-term average</u> discharge rate.		<u>0.002</u>	MGD
For batch discharges report:			
Number of decant cycles.		_____	Cycles/day
Length of each decant cycle.		_____	MIN.
Average decant discharge rate.		_____	GPM

-2-

Process Wastewater

- a. Describe process and type of wastewater.

Control Building and Cable Tunnel Sumps

Sumps receive wastewater from air conditioning unit condensation, floor-mopping (water only) wastes, fire protection water, and non-contact cooling water from Unit 2 primary heat exchanger drains (river-water-side) during maintenance activities.

- b. Production Rate.

Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.

- c. Discharge Occurs. 1 hrs/day; 7 days/wk; 12 days/yr; 12 months/yr.

During which months? ☒ All

Report the discharge rate as:

The maximum daily discharge rate. _____ MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. _____ MGD

For batch discharges report:

Number of decant cycles. _____ Cycles/day

Length of each decant cycle. _____ MIN.

Average decant discharge rate. _____ GPM

2. All Other Wastewater Contributing to this Outfall			
a. Describe the wastewater. Demineralized Water Storage Tank Drains			
b. Source(s). Demineralized water storage tank sumps receiving water from Unit 2 demineralizing water, refueling water, primary grade water tanks. Overflow from Unit 2 turbine plant demineralized water tank.			
c. Discharge Occurs. <u>2</u> hrs/day; <u>3</u> days/wk; <u>24</u> days/yr; <u>12</u> months/yr. During which months? All			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			_____ MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			_____ MGD
For batch discharges report:			
Number of decant cycles.			_____ Cycles/day
Length of each decant cycle.			_____ MIN.
Average decant discharge rate.			_____ GPM
All Other Wastewater Contributing to this Outfall			
a. Describe the wastewater. Service Water Valve Pit			
b. Source(s). Infrequent service water (river water) valve leakage and condensation			
c. Discharge Occurs. <u>0.5</u> hrs/day; <u>1</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr. During which months? All, infrequent discharge			
Report the discharge rate as:			
The <u>maximum daily</u> discharge rate.			_____ MGD
The <u>monthly average</u> discharge rate.			_____ MGD
The <u>long-term average</u> discharge rate.			_____ MGD
For batch discharges report:			
Number of decant cycles.			_____ Cycles/day
Length of each decant cycle.			_____ MIN.
Average decant discharge rate.			_____ GPM

All Other Wastewater Contributing to this Outfall			
a. Describe the wastewater. Main Steam Valve/Cable Vault Drains			
b. Source(s). Main steam valve room floor drains and condensation from air conditioning units			
c. Discharge Occurs. <u>0.5</u> hrs/day; <u>1</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr. During which months? All, infrequent discharge			
Report the discharge rate as: The <u>maximum daily</u> discharge rate. _____ MGD The <u>monthly average</u> discharge rate. _____ MGD The <u>long-term average</u> discharge rate. _____ MGD			
For batch discharges report: Number of decant cycles. _____ Cycles/day Length of each decant cycle. _____ MIN. Average decant discharge rate. _____ GPM			
All Other Wastewater Contributing to this Outfall			
a. Describe the wastewater. Safeguard Valve Pit Drains			
b. Source(s). Demineralized seal water leak off from re-circulation spray (a.k.a. Quench Spray) heat exchangers, infrequent draining for maintenance.			
c. Discharge Occurs. <u>1</u> hrs/day; <u>1</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr. During which months? All, infrequent discharge			
Report the discharge rate as: The <u>maximum daily</u> discharge rate. _____ MGD The <u>monthly average</u> discharge rate. _____ MGD The <u>long-term average</u> discharge rate. _____ MGD			
For batch discharges report: . Number of decant cycles. _____ Cycles/day Length of each decant cycle. _____ MIN. Average decant discharge rate. _____ GPM			

All Other Wastewater Contributing to this Outfall	
a. Describe the wastewater. Service Building/Pipe Tunnel Drains	
b. Source(s). Service building floor drains.	
c. Discharge Occurs. <u>0.5</u> hrs/day; <u>1</u> days/wk; <u>12</u> days/yr; <u>12</u> months/yr. During which months? All, infrequent discharge	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	_____ MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	_____ MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM
All Other Wastewater Contributing to this Outfall	
a. Describe the wastewater. Transformer Slag Pit Drains	
b. Source(s). Rainwater and fire protection (deluge) testing water.	
c. Discharge Occurs. <u>4</u> hrs/day; <u>1</u> days/wk; <u>4</u> days/yr; <u>3</u> months/yr. During which months? October through December	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	_____ MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	_____ MGD
For batch discharges report:	
Number of decant cycles.	_____ Cycles/day
Length of each decant cycle.	_____ MIN.
Average decant discharge rate.	_____ GPM

3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater

a. Source(s). Internal Monitoring Points 111 and 211, non-contact cooling water, Stormwater Runoff, Fire Protection, and Episodic Discharges including: Condensate Polishing drains, Control Building/Cable Tunnel sumps, Demineralized Water tank drains, Service Water Valve pits, Safeguard Valve pit, Service Building/Pipe tunnel drains, Transformer slag pits, and non-contact cooling water discharge/leakage

b. Discharge Occurs... 24 hrs/day; 7 days/wk; 365 days/yr; 12 months/yr.

During which months? All

Report the discharge rate as:

The maximum daily discharge rate, 0.095 MGD

The monthly average discharge rate, _____ MGD

The long-term average discharge rate, 0.056 MGD

4. Stormwater

Complete Module 12 or Module 14 for the stormwater contribution.

Applicant Name: FirstEnergy Nuclear Operating
Company (FENOC) - Beaver Valley Power Station
Outfall: 012



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
OUTFALL NUMBER	012 - Blowdown from the HVAC unit serving the emergency response facility and stormwater runoff

1. Process Wastewater

a. Describe process and type of wastewater.

b. Production Rate.

Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.

c. Discharge Occurs. _____ hrs/day; _____ days/wk; _____ days/yr; _____ months/yr.
During which months?

Report the discharge rate as:

The maximum daily discharge rate. _____ MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. _____ MGD

For batch discharges report:

Number of decant cycles. _____ Cycles/day

Length of each decant cycle. _____ MIN.

Average decant discharge rate. _____ GPM

2. All Other Wastewater Contributing to this Outfall

a. Describe the wastewater.

Emergency Response Facility (ERF) Evaporative Cooler Blowdown - When not in isolation

b. Source(s). Evaporative cooler blowdown

c. Discharge Occurs. 4 hrs/day; 7 days/wk; 365 days/yr; 12 months/yr.
During which months? All

Report the discharge rate as:

The maximum daily discharge rate. 0.002 MGD

The monthly average discharge rate. _____ MGD

The long-term average discharge rate. 0.001 MGD

For batch discharges report:

Number of decant cycles. _____ Cycles/day

Length of each decant cycle. _____ MIN.

Average decant discharge rate. _____ GPM

3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater	
a. Source(s). ERF evaporative cooler blowdown, stormwater runoff	
b. Discharge Occurs.	<u>4</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr.
During which months? All	
Report the discharge rate as:	
The <u>maximum daily</u> discharge rate.	<u>0.002</u> MGD
The <u>monthly average</u> discharge rate.	_____ MGD
The <u>long-term average</u> discharge rate.	<u>0.001</u> MGD
4. Stormwater	
Complete Module 12 or Module 14 for the stormwater contribution.	

Applicant Name: FirstEnergy Nuclear Operating
Company (FENOC) - Beaver Valley Power Station
Outfall: 013



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DEPARTMENT OF ENVIRONMENTAL PROTECTION
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**SOURCES OF WASTEWATER
MODULE 3**

Before completing this form, read the step-by-step instructions provided in Appendix 1.	
APPLICANT NAME	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
OUTFALL NUMBER	013 - Uncontaminated stormwater runoff and the sources monitored at 113, 213, 313, and 413
1. Process Wastewater	
<p>a. Describe process and type of wastewater.</p> <p>Internal Monitoring Point 313</p> <p>Oil/Water separator 21 receiving wastewater from Unit 2 turbine building floor drains. Circulating water, non-contact cooling water heat exchanger, and condensate equipment leakage and maintenance drains. Floor mopping (water-only) wastes.</p>	
<p>b. Production Rate.</p> <p>Referring to the instructions in Appendix 1 for this question, complete a Module 15, Production Rate, for each process subject to an effluent limitation listed in 40 CFR Subchapter N (Parts 400-471). Indicate the number of completed Module 15s attached to this application.</p>	
<p>c. Discharge Occurs. <u>16</u> hrs/day; <u>7</u> days/wk; <u>365</u> days/yr; <u>12</u> months/yr.</p> <p>During which months? <u>All</u></p>	
<p>Report the discharge rate as:</p> <p>The <u>maximum daily</u> discharge rate. <u>0.086</u> MGD</p> <p>The <u>monthly average</u> discharge rate. <u> </u> MGD</p> <p>The <u>long-term average</u> discharge rate. <u>0.054</u> MGD</p>	
<p>For batch discharges report:</p> <p>Number of decant cycles. <u> </u> Cycles/day</p> <p>Length of each decant cycle. <u> </u> MIN.</p> <p>Average decant discharge rate. <u> </u> GPM</p>	

2. All Other Wastewater Contributing to this Outfall

a. Describe the wastewater.

Internal Monitoring Point 113

Unit 2 Sewage Treatment Plant

b. Source(s). Unit 2 sanitary facilities

c. Discharge Occurs. 16 hrs/day; 7 days/wk; 365 days/yr; 12 months/yr.
During which months? All

Report the discharge rate as:

The maximum daily discharge rate. 0.046 MGD

The monthly average discharge rate. MGD

The long-term average discharge rate. 0.017 MGD

For batch discharges report:

Number of decant cycles. Cycles/day

Length of each decant cycle. MIN.

Average decant discharge rate. GPM

3. Total Process, Miscellaneous Noncontact Cooling, and Sanitary Wastewater

a. Source(s). Internal Monitoring Point 313, Stormwater Runoff and Unit 2 Sewage Treatment Plant

b. Discharge Occurs. 24 hrs/day; 7 days/wk; 365 days/yr; 12 months/yr.
During which months? All

Report the discharge rate as:

The maximum daily discharge rate. 0.136 MGD

The monthly average discharge rate. MGD

The long-term average discharge rate. 0.072 MGD

4. Stormwater

Complete Module 12 or Module 14 for the stormwater contribution.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Intake

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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
☒ Intake Sampling Results - Optional (Specify Source: Ohio River)
☐ Background Sampling Results - Optional (Specify Location of Sample: ____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: ____)
☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	b. Mass
Biochemical Oxygen Demand, BOD	4.2		1.40		3	mg/l	
Chemical Oxygen Demand, COD	24		8		3	mg/l	
Hardness (CaCO ₃)	126.7		111		3	CaCO ₃	
Total Suspended Solids, TSS	27		16		3	mg/l	
Total Dissolved Solids, TDS	248		212.		3	mg/l	
Ammonia as N	0.1		0.03		3	mg/l	
Nitrate-Nitrite (as N)	0.97		0.78		3	mg/l	
Total Kjeldahl Nitrogen (TKN)	0.39		0.34		3	mg/l	
Phosphorus (as P), Total	0.09		0.05		3	mg/l	
Temperature winter	Value		Value		3	C	
Temperature summer	16.0 Value		15.63 Value		3	C	
pH	Min. 7.7	Max. 7.9			3	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	50		32		3	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	770		229		3	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.56		0.34		3	mg/l		
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND		ND		3	mg/l		
Bromide	<input checked="" type="checkbox"/>	50	300	ND		ND		3	mg/L		
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	0.07		0.02		3	mg/L		
Sulfate	<input type="checkbox"/>	100	300	89		74.2		3	mg/l		
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND		ND		3	mg/l		
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND		ND		3	mg/l		
Surfactants	<input type="checkbox"/>	5	5540C	0.01		0.003		3	mg/l		
Aluminum, Total	<input type="checkbox"/>	4	200.7	1064		654		3	ug/l		
Barium, Total	<input type="checkbox"/>	15	200.7	38		33		3	ug/l		
Boron, Total	<input type="checkbox"/>	50	212.3	74		42		3	ug/l		
Cobalt, Total	<input type="checkbox"/>	2	200.7	8		3		3	ug/l		
Iron, Total	<input type="checkbox"/>	2	200.7	1504		865		3	ug/l		
Iron, Dissolved	<input type="checkbox"/>	2	200.7	37		18		3	ug/l		
Manganese, Total	<input type="checkbox"/>	4	200.7	142		114		3	ug/l		
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.7	900.0	1.1		1.0		3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	2.3		0.77		3	mg/l		
Radium, Total	<input checked="" type="checkbox"/>	1.8	903.1 & Ra-05	ND		ND		3	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	9900		8627		3	ug/l		
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND		ND		3	ug/l		
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND		ND		3	ug/l		
Titanium, Total	<input type="checkbox"/>	2	200.7	28		14		3	ug/l		

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- * It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number 001** (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	b. Mass
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	
Biochemical Oxygen Demand, BOD	12	2652	4	1068	3	mg/l	lb/day
Chemical Oxygen Demand, COD	38	8398	22	5782	3	mg/l	lb/day
Hardness (CaCO ₃)	254	54250	212	56472	3	CaCO ₃	lb/day
Total Suspended Solids, TSS	23	5083	17	4448	3	mg/l	lb/day
Total Dissolved Solids, TDS	556	103883	419	111734	3	mg/l	lb/day
Ammonia as N	ND	--	ND	--	3	mg/l	lb/day
Nitrate-Nitrite (as N)	2.01	407	1.70	455	3	mg/l	lb/day
Total Kjeldahl Nitrogen (TKN)	0.50	130	0.47	125	3	mg/l	lb/day
Phosphorus (as P), Total	0.76	168	0.57	152	3	mg/l	lb/day
Temperature winter	Value		Value		3	C	
Temperature summer	20.9 Value		20.6 Value		3	C	
pH	Min. 6.34	Max. 8.60			56	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	30	--	25	--	1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	61	--	6	--	3	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.44	82.2	0.30	80.1	3	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--	ND	--	3	mg/l	lb/day	
Bromide	<input type="checkbox"/>	50	300	1.76	329	0.59	157	3	mg/L	lb/day	
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	0.33	95.2	0.03	8.01	98	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	171	40890	141	37692	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.013	2.87	0.009	2.40	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	1051	232	635	169	3	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	78	17.6	69	18.4	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	122	22.8	83	22.2	3	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	15	3.32	7	1.96	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	1701	376	979	261	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	45	11.5	28	7.56	3	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	144	31.8	103	29.6	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.9	900.0	7.6	--	3.7	--	3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	4.7	878	3.4	907	3	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.9	901.3 & Ra-05	ND	--	ND	--	3	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	20170	4210	16370	4369	3	ug/l	lb/day	
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	29	6.41	16	4.18	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Influent to Internal Monitoring Point 101

COMMONWEALTH OF PENNSYLVANIA
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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: ____)
☐ Background Sampling Results - Optional (Specify Location of Sample)
☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 101
☐ New Discharge (Basis for Information: ____)
☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	<3	--			1	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day	
Hardness (CaCO ₃)	6.3	13.2			1	CaCO3	lb/day	
Total Suspended Solids, TSS	<4	--			1	mg/l	lb/day	
Total Dissolved Solids, TDS	24	50.4			1	mg/l	lb/day	
Ammonia as N	10.8	22.7			1	mg/l	lb/day	
Nitrate-Nitrite (as N)	4.79	10.1			1	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	8.3	17.4			1	mg/l	lb/day	
Phosphorus (as P), Total	<0.05	--			1	mg/l	lb/day	
Temperature winter	Value		Value		1	C		
Temperature summer	25.6 Value		Value		1	C		
pH	Min. 7.7	Max. 7.7			1	Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	10	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	112	--			1	counts/100ml		
Fluoride	<input checked="" type="checkbox"/>	100	340.2	ND	--			1	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--			1	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--			1	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--			1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	14.2	29.8			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input checked="" type="checkbox"/>	5	5540C	ND	--			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	60	0.126			1	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--			1	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	69	0.145			1	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	2	0.004			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	202	0.425			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	27	0.057			1	ug/l	lb/day	
Manganese, Total	<input checked="" type="checkbox"/>	4	200.7	ND	--			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input checked="" type="checkbox"/>	1.4	900	ND	--			1	pCi/l		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	3	0.006			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	2.0	903.1 & Ra-05	ND	--			1	pCi/l		
Magnesium	<input type="checkbox"/>	30	200.7	400	0.841			1	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	407	0.855			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	4	0.008			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 101

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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 101 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	b.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	Mass	
Biochemical Oxygen Demand, BOD	5.2	0.390	2	0.130	3	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	-	<20	-	3	mg/l	lb/day	
Hardness (CaCO ₃)	20	1.48	12	0.93	3	CaCO ₃	lb/day	
Total Suspended Solids, TSS	39	2.93	4.5	0.338	25	mg/l	lb/day	
Total Dissolved Solids, TDS	36	2.70	27	2.00	3	mg/l	lb/day	
Ammonia as N	11.3	0.848	6.60	0.495	3	mg/l	lb/day	
Nitrate-Nitrite (as N)	1.79	0.134	0.76	0.057	3	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	8.80	0.661	4.43	0.333	3	mg/l	lb/day	
Phosphorus (as P), Total	0.1	0.008	0.03	0.003	3	mg/l	lb/day	
Temperature winter	Value		Value		3	C		
Temperature summer	25.4 Value		25.4 Value		3	C		
pH	Min. 6.20	Max. 8.22			49	Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
- 1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
Color	<input type="checkbox"/>	1	110.2	30	--	15	--	3	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	1050	--	478	--	3	counts/100ml		
Fluoride	<input checked="" type="checkbox"/>	100	340.2	ND	--	ND	--	3	mg/l	lb/day	
Oil and Grease	<input type="checkbox"/>	5000	1664A	5.6	0.420	0.2	0.015	25	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--	ND	--	3	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--	ND	--	3	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	17	1.28	15	1.14	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.015	0.0011	0.009	0.0007	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	426	0.032	172	0.013	3	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--	ND	--	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	68	0.005	65	0.005	3	ug/l	lb/day	
Cobalt, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	1850	0.139	742	0.056	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	34	0.003	30	0.002	3	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	215	0.016	86	0.006	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input checked="" type="checkbox"/>	0.7	900.0	ND	--	ND	--	3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	5.02	0.377	2.7	0.203	3	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	0.9	903.1 & RA-05	ND	--	ND	--	3	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	1420	0.107	867	0.065	3	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	403	0.030	168.67	0.013	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	6	0.0005	3	0.0002	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 301 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	b. Mass
Biochemical Oxygen Demand, BOD	11	0.092	8	0.063	3	mg/l	lb/day
Chemical Oxygen Demand, COD	<20	--	<20	--	3	mg/l	lb/day
Hardness (CaCO ₃)	<2	--	<2	--	3	CaCO ₃	lb/day
Total Suspended Solids, TSS	13.3	0.111	1.2	0.010	30	mg/l	lb/day
Total Dissolved Solids, TDS	12	0.100	4	0.03	3	mg/l	lb/day
Ammonia as N	5.4	0.045	3.47	0.029	3	mg/l	lb/day
Nitrate-Nitrite (as N)	<0.05	--	<0.05	--	3	mg/l	lb/day
Total Kjeldahl Nitrogen (TKN)	13	0.108	6.13	0.051	3	mg/l	lb/day
Phosphorus (as P), Total	<0.05	--	<0.05	--	3	mg/l	lb/day
Temperature winter	Value		Value		3	C	
Temperature summer	35.1 Value		32.5 Value		3	C	
pH	Min. 8.60	Max. 8.90			3	Standard units	Standard units

1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.

1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	15	--	10	--	3	Units		
Fecal Coliform	<input checked="" type="checkbox"/>	2	SM9222 D	ND	--	ND	--	3	counts/100ml		
Fluoride	<input checked="" type="checkbox"/>	100	340.2	ND	--	ND	--	3	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--	ND	--	30	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--	ND	--	3	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--	ND	--	3	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	0.2	0.002	0	0.002	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.013	0.0001	0.006	0.0001	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	15	0.0001	12	0.0001	3	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--	ND	--	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	3632	0.0303	2636	0.022	3	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	6	0.0001	2	0.00002	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	197	0.0016	130	0.001	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	13	0.0001	11	0.0001	3	ug/l	lb/day	
Manganese, Total	<input checked="" type="checkbox"/>	4	200.7	ND	--	ND	--	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input checked="" type="checkbox"/>	1.5	900.0	ND	--	ND	--	3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	6.07	0.051	3.3	0.027	3	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.8	903.1 & Ra-05	ND	--	ND	--	3	pCi/L		
Magnesium	<input checked="" type="checkbox"/>	30	200.7	ND	--	ND	--	3	ug/l	lb/day	
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 401

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number Internal Monitoring Point 401** (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	b. Mass.
Biochemical Oxygen Demand, BOD	140	1.17	93	0.778	3	mg/l	lb/day
Chemical Oxygen Demand, COD	195	1.63	179	1.49	3	mg/l	lb/day
Hardness (CaCO ₃)	15	0.128	11	0.090	3	CaCO ₃	lb/day
Total Suspended Solids, TSS	16.5	0.108	3	0.027	3	mg/l	lb/day
Total Dissolved Solids, TDS	36	0.300	28	0.234	3	mg/l	lb/day
Ammonia as N	10.8	0.090	4.60	0.038	3	mg/l	lb/day
Nitrate-Nitrite (as N)	<0.05	--	<0.05	--	3	mg/l	lb/day
Total Kjeldahl Nitrogen (TKN)	30	0.250	12.27	0.102	3	mg/l	lb/day
Phosphorus (as P), Total	<0.05	--	<0.05	--	3	mg/l	lb/day
Temperature winter	Value		Value		3	C	
Temperature summer	26.7 Value		23.4 Value		3	C	
pH	Min. 7.55	Max. 9.98			30	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
 1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
 1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	20	--	10	--	3	Units		
Fecal Coliform	<input checked="" type="checkbox"/>	2	SM9222 D	ND	--	ND	--	3	counts/100ml		
Fluoride	<input checked="" type="checkbox"/>	100	340.2	ND	--	ND	--	3	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--	ND	--	30	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--	ND	--	3	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--	ND	--	3	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	2.2	0.018	2	0.014	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.018	0.0002	0.009	0.0001	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	189	0.002	153	0.001	3	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--	ND	--	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	232	0.002	215	0.002	3	ug/l	lb/day	
Cobalt, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	390	0.003	306	0.003	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	38	0.0003	18	0.0002	3	ug/l	lb/day	
Manganese, Total	<input checked="" type="checkbox"/>	4	200.7	ND	--	ND	--	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	1.5	900	4.0	--	2.8	--	3	pCi/l		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	63.7	0.531	56.5	0.471	3	mg/l	lb/day	
Radium, Total	<input type="checkbox"/>	2.0	903.1 & Ra-05	1.4	--	1.4	--	3	pCi/l		
Magnesium	<input type="checkbox"/>	30	200.7	90	0.001	30	0.0003	3	ug/l	lb/day	
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	5	0.00004	3	0.00003	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 102

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DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4.**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number Internal Monitoring Point 102** (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	b. Mass
Biochemical Oxygen Demand, BOD	<3.0	--			1	mg/l	lb/day
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day
Hardness (CaCO ₃)	124.5	1.04			1	CaCO ₃	lb/day
Total Suspended Solids, TSS	88.5	0.738	17	0.142	31	mg/l	lb/day
Total Dissolved Solids, TDS	200	1.67			1	mg/l	lb/day
Ammonia as N	<0.1	--			1	mg/l	lb/day
Nitrate-Nitrite (as N)	1.49	0.012			1	mg/l	lb/day
Total Kjeldahl Nitrogen (TKN)	0.45	0.004			1	mg/l	lb/day
Phosphorus (as P), Total	0.09	0.001			1	mg/l	lb/day
Temperature winter	Value		Value		1	C	
Temperature summer	22.1 Value		Value		1	C	
pH	Min. 6.60	Max. 8.05			29	Standard units	Standard units

1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.

1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	10	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	660	--			1	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.17	0.001			1	mg/l	lb/day	
Oil and Grease	<input type="checkbox"/>	5000	1664A	31.5	0.2627	1.1	0.009	28	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--			1	mg/L	lb/day	
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	0.09	0.00			1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	67.1	0.560			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.008	0.0001			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	201	0.002			1	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	39	0.0003			1	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	58	0.0005			1	ug/l	lb/day	
Cobalt, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	254	0.002			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	16	0.0001			1	ug/l	lb/day	
Manganese, Total	<input checked="" type="checkbox"/>	4	200.7	ND	--			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.7	900.0	1.1	--			1	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	3.2	0.00003			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	0.7	903.1 & Ra-05	ND	--			1	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	9690	0.081			1	ug/l	lb/day	
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND	--			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	4	0.00003			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 1 MODULE 4

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Background Sampling Results - Optional (Specify Location of Sample)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 103
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	<3	--			1	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day	
Hardness (CaCO ₃)	102.2	281			1	CaCO3	lb/day	
Total Suspended Solids, TSS	11	30.3			1	mg/l	lb/day	
Total Dissolved Solids, TDS	196	539			1	mg/l	lb/day	
Ammonia as N	0.3	0.83			1	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.82	2.26			1	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	2.2	6.05			1	mg/l	lb/day	
Phosphorus (as P), Total	0.08	0.220			1	mg/l	lb/day	
Temperature winter	Value		Value		1	C		
Temperature summer	18.4 Value		Value		1	C		
pH	Min. 7.6	Max. 7.6			1	Standard units	Standard units	Standard units

1.a. Maximum Daily Value - Report the **highest** daily value or daily average value from the last year of data. Report both mass and concentration.

1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.

1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	15	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	190	--			1	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.23	0.63			1	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--			1	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--			1	mg/L	lb/day	
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	0.24	0.66			1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	56.2	155			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.005	0.014			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	183	0.504			1	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	26	0.072			1	ug/l	lb/day	
Boron, Total	<input checked="" type="checkbox"/>	50	212.3	ND	--			1	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	5	0.014			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	554	1.52			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	16	0.044			1	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	62	0.171			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.8	900.0	2.3	--			1	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	3.1	0.009			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.7	903.1 & Ra-05	ND	--			1	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	8020	22.1			1	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	13	0.036			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	9	0.025			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value -- Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis -- Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 103

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 103 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	b. Mass
Biochemical Oxygen Demand, BOD	4	3.07	1	1.02	3	mg/l	lb/day
Chemical Oxygen Demand, COD	ND	--	ND	--	3	mg/l	lb/day
Hardness (CaCO ₃)	179	137	128	98.5	3	CaCO ₃	lb/day
Total Suspended Solids, TSS	15	11.5	9.6	7.37	31	mg/l	lb/day
Total Dissolved Solids, TDS	412	316	268	206	3	mg/l	lb/day
Ammonia as N	0.5	0.384	0.30	0.230	3	mg/l	lb/day
Nitrate-Nitrite (as N)	1.7	1.30	1.18	0.903	3	mg/l	lb/day
Total Kjeldahl Nitrogen (TKN)	1.80	1.38	0.97	0.742	3	mg/l	lb/day
Phosphorus (as P), Total	0.1	0.077	0.03	0.026	3	mg/l	lb/day
Temperature winter	Value		Value		3	C	
Temperature summer	18.6 Value		17.6 Value		3	C	
pH	Min. 6.88	Max. 7.80			34	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	15	--	8	--	3	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	134	--	26	--	3	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.25	0.192	0.22	0.169	3	mg/l	lb/day	
Oil and Grease	<input type="checkbox"/>	5000	1664A	31.5	0.263	1.1	0.009	28	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--	ND	--	3	mg/L	lb/day	
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	0.23	0.176	0.08	0.059	3	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	140.6	108	87	67.1	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.019	0.015	0.009	0.007	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	404	0.310	212	0.163	3	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	58	0.045	40	0.031	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	68	0.052	44	0.034	3	ug/l	lb/day	
Cobalt, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	1156	0.887	451	0.346	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	37	0.028	27	0.021	3	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	592	0.454	242	0.186	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	1.6	900.0	2.0	--	1.7	--	3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	6.02	4.62	5.5	4.25	3	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	2.0	903.1 & Ra-05	ND	--	ND	--	3	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	13780	10.6	9937	7.62	3	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	149	0.114	88.33	0.068	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	30	0.023	12	0.009	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 203

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number Internal Monitoring Point 203** (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: I _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	7.8	0.638	7.8	0.911	2	mg/l	lb/day	
Chemical Oxygen Demand, COD	82	9.44	75	8.76	2	mg/l	lb/day	
Hardness (CaCO ₃)	170.2	17.4	161	18.8	2	CaCO3	lb/day	
Total Suspended Solids, TSS	28	3.22	26	2.98	2	mg/l	lb/day	
Total Dissolved Solids, TDS	1040	89.3	908	106	2	mg/l	lb/day	
Ammonia as N	0.8	0.092	0.60	0.070	2	mg/l	lb/day	
Nitrate-Nitrite (as N)	51.6	4.70	46.2	5.39	2	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	2.9	0.334	2.25	0.263	2	mg/l	lb/day	
Phosphorus (as P), Total	9.15	1.05	6.59	0.769	2	mg/l	lb/day	
Temperature winter	Value		Value		2	C		
Temperature summer	22.5 Value		19.6 Value		2	C		
pH	Min. 6.81	Max. 8.35			33	Standard units	Standard units	Standard units

1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.

1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	15	--	15	--	2	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	1800	--	17	--		counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.31	0.036	0.25	0.029	2	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--	ND	--	2	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--	ND	--	2	mg/L	lb/day	
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	2.2	0.257	0.58	0.068	142	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	92.8	9.48	87.6	10.2	2	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	2	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	2	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.014	0.001	0.014	0.001	2	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	86	0.007	43	0.005	2	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	44	0.005	32	0.004	2	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	78	0.009	77	0.009	2	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	4	0.0005	2	0.0002	2	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	349	0.029	257	0.030	2	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	94	0.0097	89	0.010	2	ug/l	lb/day	
Manganese, Total	<input checked="" type="checkbox"/>	4	200.7	ND	--	ND	--	2	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	1.8	900.0	9.6	--			1	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	16.9	1.95	16.5	1.92	2	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	0.8	903.1 & Ra-05	ND	--			1	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	12620	1.25	11735	1.37	2	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	17	0.002	8.50	0.001	2	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	2	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	17	0.002	13	0.002	2	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 1 MODULE 4

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: ____)
☐ Background Sampling Results - Optional (Specify Location of Sample: ____)
☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 303
☐ New Discharge (Basis for Information: ____)
☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	4.8	0.761			1	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day	
Hardness (CaCO ₃)	37.8	5.99			1	CaCO3	lb/day	
Total Suspended Solids, TSS	10	1.58			1	mg/l	lb/day	
Total Dissolved Solids, TDS	64	10.1			1	mg/l	lb/day	
Ammonia as N	3	0.475			1	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.58	0.092			1	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)					1	mg/l	lb/day	
Phosphorus (as P), Total	0.07	0.011			1	mg/l	lb/day	
Temperature winter	Value		Value		1	C		
Temperature summer	26.7 Value		Value		1	C		
pH	Min. 8.90	Max. 8.90				Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
 1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
 1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	5	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	>6000	--			1	counts/100ml		
Fluoride	<input checked="" type="checkbox"/>	100	340.2	ND	--			1	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--			1	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--			1	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--			1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	21.2	3.36			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.008	0.001			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	99	0.016			1	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--			1	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	54	0.009			1	ug/l	lb/day	
Cobalt, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	87	0.014			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	10	0.002			1	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	39	0.006			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.8	900.0	0.9	--			1	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	1.9	0.0003			1	mg/l	lb/day	
Radium, Total	<input type="checkbox"/>	0.7	903.1 & Ra-1	1.6	--			1	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	2860	0.453			1	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	394	0.062			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	3	0.0005			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 303 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	b. Mass
Biochemical Oxygen Demand, BOD	7	0.117	5	7	3	mg/l	lb/day
Chemical Oxygen Demand, COD	<20	--	<20	--	3	mg/l	lb/day
Hardness (CaCO ₃)	53	0.884	42	53	3	CaCO ₃	lb/day
Total Suspended Solids, TSS	14	0.234	8	14	3	mg/l	lb/day
Total Dissolved Solids, TDS	96	1.60	71	96	3	mg/l	lb/day
Ammonia as N	11.6	0.193	5.93	11.6	3	mg/l	lb/day
Nitrate-Nitrite (as N)	0.46	0.008	0.30	0.46	3	mg/l	lb/day
Total Kjeldahl Nitrogen (TKN)					3	mg/l	lb/day
Phosphorus (as P), Total	0.37	0.006	0.17	0.37	3	mg/l	lb/day
Temperature winter	Value		Value		3	C	
Temperature summer	24.4 Value		21.7 Value		3	C	
pH	Min. 6.20	Max.			50	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
Color	<input type="checkbox"/>	1	110.2	40	--	17	--	3	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	640	--	640	--	3	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.12	0.002	0.08	0.001	3	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--	ND	--	50	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--	ND	--	3	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--	ND	--	3	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	28.3	0.472	18	0.305	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	10	0.167	3.347	0.0558	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	80	0.0013	52	0.0009	3	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	22	0.0004	13	0.0002	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	70	0.0012	42	0.001	3	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	8	0.0001	4	0.00007	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	3917	0.065	1499	0.025	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	561	0.0094	236	0.0039	3	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	406	0.007	212	0.004	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.8	900.0	1.4	--	0.47	--	3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	6.93	0.116	4.6	0.077	3	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.0	903.1 & Ra-05	ND	--	ND	--	3	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	3930	0.066	2900	0.048	3	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	249	0.004	180.67	0.003	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 403

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number Internal Monitoring Point 403** (Sample is representative of water that would be discharged) (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	<3	--			1	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day	
Hardness (CaCO ₃)	41.9	5.24			1	CaCO3	lb/day	
Total Suspended Solids, TSS	7	0.876			1	mg/l	lb/day	
Total Dissolved Solids, TDS	116	14.5			1	mg/l	lb/day	
Ammonia as N	3.3	0.41			1	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.92	0.12			1	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	4.3	0.54			1	mg/l	lb/day	
Phosphorus (as P), Total	0.23	0.029			1	mg/l	lb/day	
Temperature winter	Value		Value		1	C		
Temperature summer	22.5 Value		Value		1	C		
pH	Min. 8.5	Max. 8.5			1	Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
- 1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	5	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	42	--			1	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.11	0.014			1	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--			1	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--			1	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--			1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	29.2	3.65			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.009	0.001			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	126	0.016			1	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--			1	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	979	0.122			1	ug/l	lb/day	
Cobalt, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	57	0.0071			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	57	0.0071			1	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	11	0.0014			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input checked="" type="checkbox"/>	0.7	900	ND	--			1	pCi/l		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	2.8	0.0004			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.8	903.1 & RA-05	ND	--			1	pCi/l		
Magnesium	<input type="checkbox"/>	30	200.7	3130	0.39			1	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	2300	0.29			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	3	0.0004			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 010

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number 010** (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	<3	--			1	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day	
Hardness (CaCO ₃)	118	4960			1	CaCO3	lb/day	
Total Suspended Solids, TSS	<4	--			1	mg/l	lb/day	
Total Dissolved Solids, TDS	228	9584			1	mg/l	lb/day	
Ammonia as N	<0.1	--			1	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.8	33.6			1	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	0.34	14.3			1	mg/l	lb/day	
Phosphorus (as P), Total	<0.05	--			1	mg/l	lb/day	
Temperature winter	Value		Value		1	C		
Temperature summer	18.5 Value		Value		1	C		
pH	Min. 6.14	Max. 8.5			56	Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input checked="" type="checkbox"/>	1	110.2	ND	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	101	--			1	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.52	21.9			1	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--			1	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--			1	mg/L	lb/day	
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	0.18	7.57	0.017	0.71	54	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	81.9	3443			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	15	631			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	254	10.7			1	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	39	1.64			1	ug/l	lb/day	
Boron, Total	<input checked="" type="checkbox"/>	50	212.3	ND	--			1	ug/l	lb/day	
Cobalt, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	431	18.1			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	21	0.883			1	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	95	3.99			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.08	900	0.9	--			1	pCi/l		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	2.2	0.0925			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.6	903.1 & Ra-05	ND	--			1	pCi/l		
Magnesium	<input type="checkbox"/>	30	200.7	9120	383			1	ug/l	lb/day	
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND	--			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	5	0.210			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Influent to Internal Monitoring Point 111

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: ____)
☐ Background Sampling Results - Optional (Specify Location of Sample)
☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 111
☐ New Discharge (Basis for Information: ____)
☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	<3	--			1	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day	
Hardness (CaCO ₃)	11.2	0.187			1	CaCO3	lb/day	
Total Suspended Solids, TSS	<4	--			1	mg/l	lb/day	
Total Dissolved Solids, TDS	48	0.801			1	mg/l	lb/day	
Ammonia as N	0.5	0.008			1	mg/l	lb/day	
Nitrate-Nitrite (as N)	<0.05	--			1	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	0.22	0.004			1	mg/l	lb/day	
Phosphorus (as P), Total	<0.05	--			1	mg/l	lb/day	
Temperature winter	Value		Value		1	C		
Temperature summer	19.2 Value		Value		1	C		
pH	Min. 6.10	Max. 6.10			1	Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	5	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	61	--			1	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.11	0.002			1	mg/l	lb/day	
Oil and Grease	<input type="checkbox"/>	5000	1664A	20	0.334			1	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--			1	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--			1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	2.6	0.043			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.013	0.0002			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	17	0.0003			1	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--			1	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	97	0.0016			1	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	5	0.0001			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	117	0.002			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	5	0.001			1	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	257	0.004			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input checked="" type="checkbox"/>	0.8	900.0	ND	--	ND	--	1	pCi/L		
Total Organic Carbon, TOC	<input checked="" type="checkbox"/>	1000	9060	ND	--			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	0.9	903.1 & Ra-05	ND	--	ND	--	1	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	260	0.004			1	ug/l	lb/day	
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND	--			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 111

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number Internal Monitoring Point 111** (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	b.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	Mass	
Biochemical Oxygen Demand, BOD	6	0.100	3	0.052	3	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--	<20	--	3	mg/l	lb/day	
Hardness (CaCO ₃)	97	1.61	94	1.57	3	CaCO ₃	lb/day	
Total Suspended Solids, TSS	7	0.117	5	0.078	3	mg/l	lb/day	
Total Dissolved Solids, TDS	1028	17.1	996	16.6	3	mg/l	lb/day	
Ammonia as N	<0.1	--	<0.1	ND	3	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.34	0.006	0.31	0.005	3	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	0.84	0.014	0.37	0.007	3	mg/l	lb/day	
Phosphorus (as P), Total	<0.05	--	<0.05	--	3	mg/l	lb/day	
Temperature winter	Value		Value					
Temperature summer	22.8 Value		21.2 Value		3	C		
pH	Min. 7.12	Max. 8.85			23	Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	20	--	13	--	3	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	19	--	3	--	3	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.22	0.004	0.21	0.003	3	mg/l	lb/day	
Oil and Grease	<input type="checkbox"/>	5000	1664A	12.7	0.212	1.8	0.030	24	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--	ND	--	3	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--	ND	--	3	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	18.2	0.304	18	.299	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.042	0.0007	0.024	0.0004	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	22	0.004	18	0.003	3	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--	ND	--	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	248	0.004	240	0.004	3	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	2	0.00003	1	0.00002	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	912	0.015	838	0.014	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	28	0.0005	19	0.0003	3	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	621	0.010	614	0.010	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	3.0	900.0	3.5	--	2.3	--	3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	8.21	0.137	5.8	0.097	3	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.2	903.1 & Ra-05	ND	--	ND	--	3	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	3920	0.065	3917	0.065	3	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	12	0.0002	8	0.0001	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station

Outfall: Influent to Internal Monitoring Point 211

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location of Sample)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 211
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	9.1	0.152			1	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day	
Hardness (CaCO ₃)	71	1.18			1	CaCO3	lb/day	
Total Suspended Solids, TSS	11	0.183			1	mg/l	lb/day	
Total Dissolved Solids, TDS	164	2.74			1	mg/l	lb/day	
Ammonia as N	1.6	0.027			1	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.25	0.004			1	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	2.1	0.035			1	mg/l	lb/day	
Phosphorus (as P), Total	0.24	0.004			1	mg/l	lb/day	
Temperature winter	Value		Value		1	C		
Temperature summer	19.8 Value		Value		1	C		
pH	Min. 7.1	Max. 7.1			1	Standard units	Standard units	Standard units

1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.

1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
Color	<input type="checkbox"/>	1	110.2	20	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	>6000	--			1	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.12	0.002			1	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--			1	mg/l	lb/day	
Bromide	<input type="checkbox"/>	50	300	0.21	0.004			1	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--			1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	48.8	0.814			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.027	0.0005			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	184	0.003			1	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	26	0.0004			1	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	1482	0.0247			1	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	16	0.0003			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	1498	0.0250			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	278	0.0046			1	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	95	0.0016			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.7	900	0.8	--			1	pCi/l		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	6	0.0001			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.8	903.1 & Ra-05	ND	--			1	pCi/l		
Magnesium	<input type="checkbox"/>	30	200.7	5370	0.090			1	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	293	0.005			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	4	0.0001			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC) -
Beaver Valley Power Station
Outfall: Internal Monitoring Point 211

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 211 Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	8.8	0.147	7	0.113	3	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--	<20	--	3	mg/l	lb/day	
Hardness (CaCO ₃)	97	1.61	73	1.22	3	CaCO3	lb/day	
Total Suspended Solids, TSS	12	0.200	4	0.067	3	mg/l	lb/day	
Total Dissolved Solids, TDS	1028	17.1	424	7.07	3	mg/l	lb/day	
Ammonia as N	2.4	0.040	1.30	0.022	3	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.25	0.004	0.18	0.003	3	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	2.50	0.042	2.23	0.037	3	mg/l	lb/day	
Phosphorus (as P), Total					3	mg/l	lb/day	
Temperature winter	Value		Value		3	C		
Temperature summer	20.4 Value		19.4 Value		3	C		
pH	Min. 6.17	Max. 8.59			58	Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
- 1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	20	--	15	--	3	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	4800	--	4800	--	3	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.22	0.004	0.17	0.003	3	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--	ND	--	58	mg/l	lb/day	
Bromide	<input type="checkbox"/>	50	300	0.4	0.007	0.24	0.004	3	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--	ND	--	3	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	52.9	0.882	32	0.541	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	--	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.02	0.0003	0.011	0.0002	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	98	0.0016	67	0.0011	3	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	28	0.0005	9	0.0002	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	1370	0.023	930	0.016	3	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	3	0.0001	1	0.00002	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	1187	0.020	800	0.013	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	302	0.005	157	0.0026	3	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	621	0.010	277	0.005	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	1.5	900.0	1.6	--	0.9	--	3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	6.5	0.108	3.6	0.00007	3	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.8	903.1 & Ra-05	ND	--	ND	--	3	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	6150	0.103	4363	0.073	3	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	6988	0.117	2509	0.042	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	6	0.0001	4	0.00007	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 1 MODULE 4

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 113 (Show location of sampling point on Line Drawing)
- ☐ **Intake Sampling Results - Optional** (Specify Source: _____)
- ☐ **Background Sampling Results - Optional** (Specify Location of Sample: _____)
- ☐ **Treatment Facility Influent Sampling Results** (Show location of sampling point on Line Drawing)
- ☐ **New Discharge (Basis for Information: _____)**
- ☐ **Bypass or Sewer System Overflow (Describe: _____)**

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	b. Mass
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	
Biochemical Oxygen Demand, BOD	5.6	0.374	5.6	0.794	1	mg/l	lb/day
Chemical Oxygen Demand, COD	58	3.87	53	7.51	2	mg/l	lb/day
Hardness (CaCO ₃)	154.6	10.3	148	21.0	2	CaCO ₃	lb/day
Total Suspended Solids, TSS	15	1.00	10	1.42	2	mg/l	lb/day
Total Dissolved Solids, TDS	848	56.6	802	114	2	mg/l	lb/day
Ammonia as N	0.2	0.013	0.15	0.021	2	mg/l	lb/day
Nitrate-Nitrite (as N)	47.3	3.16	35.4	5.02	2	mg/l	lb/day
Total Kjeldahl Nitrogen (TKN)	1.3	0.080	1.25	0.177	2	mg/l	lb/day
Phosphorus (as P), Total	6.31	0.421	6.00	0.851	2	mg/l	lb/day
Temperature winter	Value		Value			C	
Temperature summer	21.8 Value		Value		2	C	
pH	Min. 6.88	Max. 8.18			37	Standard units	Standard units

1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.

1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	10	--	10	--	1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	80400	--	83	--	76	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.36	0.0240	0.33	0.047	2	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--	ND	--	2	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--	ND	--	2	mg/L	lb/day	
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	2.50	0.065	0.48	0.068	147	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	81.3	5.42	80.7	11.4	2	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	2	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	2	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.009	0.0006	0.009	0.001	1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	19	0.001	10	0.001	2	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	19	0.0008	10	0.001	2	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	58	0.004	57	0.008	2	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	5	0.0003	3	0.0004	2	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	100	0.007	61	0.009	2	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	36	0.0024	32	0.004	2	ug/l	lb/day	
Manganese, Total	<input checked="" type="checkbox"/>	4	200.7	ND	--	ND	--	2	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	2.0	900	14.3	--	14.3	--	2	pCi/l		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	12.5	0.430	11.4	1.62	2	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.9	903.1 & Ra-05	ND	--	ND	--	2	pCi/l		
Magnesium	<input type="checkbox"/>	30	200.7	11400	0.761	10880	1.54	2	ug/l	lb/day	
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND	--	ND	--	2	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	2	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	4	0.0002	4	0.0005	2	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 1 MODULE 4

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample)
☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 313
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT				2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a.	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass		Concentration	b. Mass
Biochemical Oxygen Demand, BOD	4	0.067			1	mg/l	lb/day
Chemical Oxygen Demand, COD	<20	--			1	mg/l	lb/day
Hardness (CaCO ₃)	95.3	1.59			1	CaCO ₃	lb/day
Total Suspended Solids, TSS	11	0.183			1	mg/l	lb/day
Total Dissolved Solids, TDS	212	3.54			1	mg/l	lb/day
Ammonia as N	5.3	0.088			1	mg/l	lb/day
Nitrate-Nitrite (as N)	0.14	0.002			1	mg/l	lb/day
Total Kjeldahl Nitrogen (TKN)	3.4	0.057			1	mg/l	lb/day
Phosphorus (as P), Total	0.09	0.002			1	mg/l	lb/day
Temperature winter	Value		Value		1	C	
Temperature summer	18.5 Value		Value		1	C	
pH	Min. 6.3	Max. 6.3			1	Standard units	Standard units

1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.

1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	25	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	257	--			1	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.23	0.004			1	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--			1	mg/l	lb/day	
Bromide	<input type="checkbox"/>	50	300	54.2	0.904			1	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND				1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	54.2	0.904			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.005	0.001			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	26	0.004			1	ug/l	lb/day	
Barium, Total	<input checked="" type="checkbox"/>	15	200.7	ND	--			1	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	674	0.011			1	ug/l	lb/day	
Cobalt, Total	<input checked="" type="checkbox"/>	2	200.7	ND	--			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	1062	0.018			1	ug/l	lb/day	
Iron, Dissolved	<input checked="" type="checkbox"/>	2	200.7	ND	--			1	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	158	0.003			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input checked="" type="checkbox"/>	0.7	900.0	ND	--	ND	--	1	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	4.2	0.001			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.2	903.1 & Ra-05	ND	--	ND	--	1	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	6980	0.113			1	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	11	0.002			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	2	0.00003			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 1
MODULE 4**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 313 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	6	0.100	3	0.050	3	mg/l	lb/day	
Chemical Oxygen Demand, COD	<20	--	<20	--	3	mg/l	lb/day	
Hardness (CaCO ₃)	87	1.46	82	1.36	3	CaCO3	lb/day	
Total Suspended Solids, TSS	9	0.150	8	0.133	3	mg/l	lb/day	
Total Dissolved Solids, TDS	212	3.54	197	3.29	3	mg/l	lb/day	
Ammonia as N	11.2	0.187	6.53	0.109	3	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.73	0.012	0.27	0.005	3	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	4.30	0.072	3.77	0.063	3	mg/l	lb/day	
Phosphorus (as P), Total	0.1	0.002	0.06	0.001	3	mg/l	lb/day	
Temperature winter	Value		Value		3	C		
Temperature summer	22.5 Value		18.8 Value		3	C		
pH	Min. 6.31	Max. 8.07			49	Standard units	Standard units	Standard units

- 1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.
1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	30	--	28	--	3	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	880	--	37	--	3	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.24	0.004	0.22	0.004	3	mg/l	lb/day	
Oil and Grease	<input type="checkbox"/>	5000	1664A	373	6.22	6.9	0.115	54	mg/l	lb/day	
Bromide	<input type="checkbox"/>	50	300	0.52	0.009	0.43	0.007	3	mg/L	lb/day	
Chlorine, Total Residual	<input checked="" type="checkbox"/>	0.02	330.5	ND	--	ND	--	3	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	51.7	0.862	49	0.810	3	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--	ND	--	3	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--	ND	--	3	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.012	0.0002	0.010	0.0002	3	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	39	0.0007	18	0.0003	3	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	26	0.0004	9	0.0001	3	ug/l	lb/day	
Boron, Total	<input type="checkbox"/>	50	212.3	7686	0.128	4019	0.067	3	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	6	0.0001	2	0.00003	3	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	1575	0.0263	1199	0.020	3	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	54	0.0009	22	0.0004	3	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	324	0.005	278	0.005	3	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	1.6	900.0	2.8	--	1.5	--	3	pCi/L		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	9.15	0.153	7.5	0.126	3	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	1.1	903.1 & Ra-05	ND	--	ND	--	3	pCi/L		
Magnesium	<input type="checkbox"/>	30	200.7	6310	0.105	5877	0.098	3	ug/l	lb/day	
Molybdenum	<input type="checkbox"/>	10	200.7	138	0.002	59.33	0.001	3	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--	ND	--	3	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	3	0.0001	2	0.00004	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 1 MODULE 4

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 413 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location of Sample: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 1	1. LEVEL PRESENT					2. UNITS		3. Coefficient of Effluent Variability (CV)
	a. Maximum Daily Value		b. Average of Analysis		c. No. of Analysis	a. Concentration	b. Mass	
	(1) Concentration	(2) Mass	(1) Concentration	(2) Mass				
Biochemical Oxygen Demand, BOD	22	0.183			1	mg/l	lb/day	
Chemical Oxygen Demand, COD	79	0.659			1	mg/l	lb/day	
Hardness (CaCO ₃)	82.7	0.690			1	CaCO3	lb/day	
Total Suspended Solids, TSS	84.5	0.705	27	0.225	21	mg/l	lb/day	
Total Dissolved Solids, TDS	156	1.30			1	mg/l	lb/day	
Ammonia as N	2.3	0.019			1	mg/l	lb/day	
Nitrate-Nitrite (as N)	0.17	0.001			1	mg/l	lb/day	
Total Kjeldahl Nitrogen (TKN)	1.8	0.015			1	mg/l	lb/day	
Phosphorus (as P), Total	0.19	0.002			1	mg/l	lb/day	
Temperature winter	Value		Value		1	C		
Temperature summer	17.9 Value		Value		1	C		
pH	Min. 6.30	Max. 7.71			20	Standard units	Standard units	Standard units

1.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

1.b. Average of Analysis - The average of all values within the last year and report both the mass and concentration.

1.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

POLLUTANT GROUP 1	Believed Absent	1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Color	<input type="checkbox"/>	1	110.2	100	--			1	Units		
Fecal Coliform	<input type="checkbox"/>	2	SM9222 D	140	--			1	counts/100ml		
Fluoride	<input type="checkbox"/>	100	340.2	0.26	0.002			1	mg/l	lb/day	
Oil and Grease	<input checked="" type="checkbox"/>	5000	1664A	ND	--	ND	--	19	mg/l	lb/day	
Bromide	<input checked="" type="checkbox"/>	50	300	ND	--			1	mg/L	lb/day	
Chlorine, Total Residual	<input type="checkbox"/>	0.02	330.5	0.07	0.001			1	mg/L	lb/day	
Sulfate	<input type="checkbox"/>	100	300	37.3	0.311			1	mg/l	lb/day	
Sulfide	<input checked="" type="checkbox"/>	1000	9030A	ND	--			1	mg/l	lb/day	
Sulfite	<input checked="" type="checkbox"/>	2000	377.1	ND	--			1	mg/l	lb/day	
Surfactants	<input type="checkbox"/>	5	5540C	0.007	0.0001			1	mg/l	lb/day	
Aluminum, Total	<input type="checkbox"/>	4	200.7	401	0.003			1	ug/l	lb/day	
Barium, Total	<input type="checkbox"/>	15	200.7	17	0.0001			1	ug/l	lb/day	
Boron, Total	<input checked="" type="checkbox"/>	50	212.3	ND	--			1	ug/l	lb/day	
Cobalt, Total	<input type="checkbox"/>	2	200.7	3	0.00003			1	ug/l	lb/day	
Iron, Total	<input type="checkbox"/>	2	200.7	14138	0.118			1	ug/l	lb/day	
Iron, Dissolved	<input type="checkbox"/>	2	200.7	783	0.007			1	ug/l	lb/day	
Manganese, Total	<input type="checkbox"/>	4	200.7	241	0.002			1	ug/l	lb/day	
Radioactivity (Total Alpha and Beta)	<input type="checkbox"/>	0.7	900	4.6	--			1	pCi/l		
Total Organic Carbon, TOC	<input type="checkbox"/>	1000	9060	24.8	0.0002			1	mg/l	lb/day	
Radium, Total	<input checked="" type="checkbox"/>	0.9	903.1 & Ra-05	ND	--			1	pCi/l		
Magnesium	<input type="checkbox"/>	30	200.7	1580	0.013			1	ug/l	lb/day	
Molybdenum	<input checked="" type="checkbox"/>	10	200.7	ND	--			1	ug/l	lb/day	
Tin, Total	<input checked="" type="checkbox"/>	80	200.7	ND	--			1	ug/l	lb/day	
Titanium, Total	<input type="checkbox"/>	2	200.7	13	0.0001			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☒ Intake Sampling Results - Optional (Specify Source: Ohio River)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	9		4		3	ug/l		
2M	Arsenic, Total	10	200.7	35		16		3	ug/l		
3M	Beryllium, Total	2	200.7	ND		ND		3	ug/l		
4M	Cadmium, Total	2	200.7	ND		ND		3	ug/l		
5M	Chromium III	2	200.7	ND		ND		3	ug/l		
5M	Chromium VI	3	218.5	ND		ND		3	ug/l		
6M	Copper, Total	2	200.7	6		4		3	ug/l		
7M	Lead, Total	2	200.7	ND		ND		3	ug/l		
8M	Mercury, Total	0.2	245.2	ND		ND		3	ug/l		
9M	Nickel, Total	5	200.7	ND		ND		3	ug/l		
10M	Selenium, Total	8	200.7	ND		ND		3	ug/l		
11M	Silver, Total	1	200.7	ND		ND		3	ug/l		

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
12M	Thallium, Total	10	200.7	ND		ND		3	ug/l		
13M	Zinc, Total	8	200.7	39		24		3	ug/l		
14M	Cyanide, Total	5	200.7	ND		ND		3	mg/L		
14M	Cyanide, Free	20	4500-CN I	ND		ND		3	mg/L		
15M	Phenols, Total	5000	420.1	ND		ND		3	mg/L		

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- * It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC)
Beaver Valley Power Station

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ Outfall Number 001 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	7	2.02	3	0.890	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	46	13.3	34	9.16	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	10	2.31	6	1.60	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	5	1.11	2	0.44	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--	ND	--	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	61	13.5	52	13.8	3	ug/l	lb/day	
14M	Cyanide, Total	5	200.7	ND	--	ND	--	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--	ND	--	3	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- * It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 101
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1M	Antimony, Total	2	200.7	5	0.011			1	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	ND	--			1	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--			1	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total	2	200.7	3	0.006			1	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--			1	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--			1	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--			1	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--			1	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--			1	ug/l	lb/day	

- 3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Dally Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--			1	ug/l	lb/day	
13M	Zinc, Total	8	200.7	ND	--			1	ug/l	lb/day	
14M	Cyanide, Total	5	200.7	ND	--			1	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--			1	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--			1	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- * It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 101 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	4	0.0003	3	0.0002	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	103	0.008	34.33	0.003	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	90	0.007	33	0.002	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	623	0.047	208	0.016	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	10	0.0008	3.33	0.0003	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	44	0.003	18	0.0013	3	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	ND	--	ND	--	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	5	0.375	3	0.250	3	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 301 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	5	0.00004	2	0.00002	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	5	0.00004	2	0.00002	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--	ND	--	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	15	0.0001	8.00	0.0001	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Dally Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	ND	--	ND	--	3	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	ND	--	ND	--	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	5	0.042	3	0.028	3	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME	FirstEnergy Nuclear Operating Company - Beaver Valley Power Station
<input checked="" type="checkbox"/> Outfall Number <u>Internal Monitoring Point 401</u> (Show location of sampling point on Line Drawing)	
<input type="checkbox"/> Intake Sampling Results - Optional (Specify Source: _____)	
<input type="checkbox"/> Background Sampling Results - Optional (Specify Location: _____)	
<input type="checkbox"/> Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)	
<input type="checkbox"/> New Discharge (Basis for Information: _____)	
<input type="checkbox"/> Bypass or Sewer System Overflow (Describe: _____)	

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1M	Antimony, Total	2	200.7	3	0.00003	2	0.00002	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	8	0.0001	7	0.00006	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--	ND	--	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--	ND	--	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	31	0.0003	25	0.0002	3	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	ND	--	ND	--	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--	ND	--	3	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

• It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 102 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	ND	--			1	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	17	0.0001			1	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--			1	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total	2	200.7	6	0.0001			1	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--			1	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--			1	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--			1	ug/l	lb/day	
10M	Selenium, Total	8	200.7	14	0.0001			1	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--			1	ug/l	lb/day	
13M	Zinc, Total	8	200.7	36	0.0003			1	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	ND	--			1	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--			1	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	6	0.050			1	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC)
Beaver Valley Power Station

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 103
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	6	0.017			1	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	25	0.069			1	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--			1	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total	2	200.7	ND	--			1	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--			1	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--			1	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--			1	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--			1	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--			1	ug/l	lb/day	
13M	Zinc, Total	8	200.7	ND	--			1	ug/l	lb/day	
14M	Cyanide, Total	5	200.7	ND	--			1	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--			1	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--			1	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 103 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	6	0.005	3	0.003	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	44	0.034	23	0.017	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	3	0.002	1	0.001	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	9	0.007	3	0.002	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--	ND	--	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	37	0.028	23	0.018	3	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	0.015	0.012	0.005	0.004	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--	ND	--	3	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 303
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	ND	--			1	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	ND	--			1	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--			1	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total	2	200.7	5	0.0008			1	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--			1	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--			1	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--			1	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--			1	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
Ib/day	Thallium, Total	10	200.7	ND	--			1	ug/l		
Ib/day	Zinc, Total	8	200.7	ND	--			1	ug/l		
Ib/day	Cyanide, Total	5	335.2 CLP-M	ND	--			1	mg/L		
Ib/day	Cyanide, Free	20	4500-CN I	ND	--			1	mg/L		
Ib/day	Phenols, Total	5000	420.1	ND	--			1	mg/L		

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: FirstEnergy Nuclear Operating Company (FENOC)
Beaver Valley Power Station

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ **Outfall Number Internal Monitoring Point 303** (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	3	0.0001	2	0.00003	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--	ND	--	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	13	0.0002	4.33	0.0001	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	.15	0.0003	13	0.0002	3	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	ND	--	ND	--	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--	ND	--	3	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ **Outfall Number** Internal Monitoring Point 403 (Sample is representative of water that would be discharged) (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total										
2M	Arsenic, Total										
3M	Beryllium, Total										
4M	Cadmium, Total										
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total										
7M	Lead, Total										
8M	Mercury, Total										
9M	Nickel, Total										
10M	Selenium, Total										
11M	Silver, Total										

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total										
13M	Zinc, Total										
14M	Cyanide, Total										
14M	Cyanide, Free										
15M	Phenols, Total										

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

• It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



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BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ Outfall Number 010 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Metals	Concentration	Mass	Concentration		Mass	Concentration	Mass
1M	Antimony, Total										
2M	Arsenic, Total										
3M	Beryllium, Total										
4M	Cadmium, Total										
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total										
7M	Lead, Total										
8M	Mercury, Total										
9M	Nickel, Total										
10M	Selenium, Total										
11M	Silver, Total										

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total										
13M	Zinc, Total										
14M	Cyanide, Total										
14M	Cyanide, Free										
15M	Phenols, Total										

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
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ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☒ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 111
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	ND	--			1	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	10	0.0002			1	ug/l	lb/day	
3M	Beiryllium, Total	2	200.7	ND	--			1	ug/l	lb/day	
4M	Cadmlium, Total	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total	2	200.7	ND	--			1	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--			1	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--			1	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--			1	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--			1	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--			1	ug/l	lb/day	
13M	Zinc, Total	8	200.7	245	0.004			1	ug/l	lb/day	
14M	Cyanide, Total	5	200.7	ND	--			1	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--			1	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--			1	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: FirstEnergy Nuclear Operating Company (FENOC)
Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2 MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ **Outfall Number Internal Monitoring Point 111** (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	24	0.0004	8	0.0001	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--	ND	--	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--	ND	--	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	185	0.003	174	0.0029	3	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	ND	--	ND	--	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--	ND	--	3	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 211
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1M	Antimony, Total	2	200.7	3	0.0001			1	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	14	0.0002			1	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--			1	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total	2	200.7	17	0.0003			1	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--			1	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--			1	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--			1	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--			1	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--			1	ug/l	lb/day	
13M	Zinc, Total	8	200.7	44	0.0007			1	ug/l	lb/day	
14M	Cyanide, Total	5	200.7	ND	--			1	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--			1	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--			1	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- * It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 211 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1M	Antimony, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	24	0.0004	11	0.0002	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	14	0.0002	5	0.00008	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--	ND	--	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--	ND	--	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	152	0.003	77	0.0013	3	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	0.025	0.0004	0.01	0.0001	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	22	0.367	11	0.189	3	mg/L	lb/day	

- 3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
 - 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
 - 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
 - 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- * It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 313
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	ND	--			1	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	32	0.0005			1	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--			1	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total	2	200.7	ND	--			1	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--			1	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--			1	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--			1	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--			1	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--			1	ug/l	lb/day	
13M	Zinc, Total	8	200.7	ND	--			1	ug/l	lb/day	
14M	Cyanide, Total	52	200.7	ND	--			1	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--			1	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	ND	--			1	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- * It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number Internal Monitoring Point 313 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	17	0.0003	6	0.0001	3	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--	ND	--	3	ug/l	lb/day	
6M	Copper, Total	2	200.7	4	0.0001	1	0.00002	3	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--	ND	--	3	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--	ND	--	3	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--	ND	--	3	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--	ND	--	3	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--	ND	--	3	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
12M	Thallium, Total	10	200.7	ND	--	ND	--	3	ug/l	lb/day	
13M	Zinc, Total	8	200.7	44	0.001	23	44	3	ug/l	lb/day	
14M	Cyanide, Total	5	335.2 CLP-M	ND	--	ND	--	3	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--	ND	--	3	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	13	0.217	4	0.072	3	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.
- It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 2
MODULE 5

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company - Beaver Valley Power Station

- ☐ Outfall Number Internal Monitoring Point 413 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1M	Antimony, Total	2	200.7	ND	--			1	ug/l	lb/day	
2M	Arsenic, Total	10	200.7	ND	--			1	ug/l	lb/day	
3M	Beryllium, Total	2	200.7	ND	--			1	ug/l	lb/day	
4M	Cadmium, Total	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium III	2	200.7	ND	--			1	ug/l	lb/day	
5M	Chromium VI	3	218.5	ND	--			1	ug/l	lb/day	
6M	Copper, Total	2	200.7	16	0.0001			1	ug/l	lb/day	
7M	Lead, Total	2	200.7	ND	--			1	ug/l	lb/day	
8M	Mercury, Total	0.2	245.2	ND	--			1	ug/l	lb/day	
9M	Nickel, Total	5	200.7	ND	--			1	ug/l	lb/day	
10M	Selenium, Total	8	200.7	ND	--			1	ug/l	lb/day	
11M	Silver, Total	1	200.7	ND	--			1	ug/l	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, Intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 2 Metals		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
12M	Thallium, Total	10	200.7	ND	--			1	ug/l	lb/day	
13M	Zinc, Total	8	200.7	1090	0.009			1	ug/l	lb/day	
14M	Cyanide, Total	5	200.7	ND	--			1	mg/L	lb/day	
14M	Cyanide, Free	20	4500-CN I	ND	--			1	mg/L	lb/day	
15M	Phenols, Total	5000	420.1	19	0.158			1	mg/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis.– Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, intake water and background.
- * It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number 001 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	3	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	3	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	3	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	3	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	3	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	3	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	3	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 101
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	1	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	1	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	1	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	1	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	1	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
19V	Ethylebenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	1	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	1	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 101 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	3	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	3	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	3	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
8V	Chlorodibromomethane	.5	624	ND	--	ND	--	3	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.
3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	3	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	3	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	3	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	3	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATIONANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 103
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass	Concentration	Mass		
1V	Acrolein	25	624	ND	--	ND	--	1	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	1	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	1	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis.		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	1	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	1	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	1	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	1	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 103 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	3	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	3	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	3	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	3	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	3	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	3	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	3	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATIONApplicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power StationANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 303
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	1	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	1	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	1	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	1	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	1	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	1	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	1	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 303 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	3	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	3	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	3	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
10V	2-ChloroethylVinyl Ether	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	3	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	3	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
19V	Ethylebenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	3	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	3	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 111
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3. Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	1	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	1	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	1	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
8V	Chlorodibromomelthane	5	624	ND	--	ND	--	1	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	1	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	1	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	1	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	1	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 111 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	3	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	3	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	3	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	3	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	3	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	3	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	3	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATIONANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 211
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (ug/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	1	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	1	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	1	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	1	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	1	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	1	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	1	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 211 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	3	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	3	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	3	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	3	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	3	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	3	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	3	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.											
APPLICANT NAME		First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station									
<input type="checkbox"/> Outfall Number _____ (Show location of sampling point on Line Drawing) <input type="checkbox"/> Intake Sampling Results - Optional (Specify Source: _____) <input type="checkbox"/> Background Sampling Results - Optional (Specify Location: _____) <input checked="" type="checkbox"/> Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 313 <input type="checkbox"/> New Discharge (Basis for Information: _____) <input type="checkbox"/> Bypass or Sewer System Overflow (Describe: _____)											
POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present				4. Units		5. Coefficient of Effluent Variability (CV)	
				a. Max Daily Value		b. Average of Analysis					c. Number of Analysis
				Concentration	Mass	Concentration	Mass	Concentration	Mass		
1V	Acrolein	25	624	ND	--	ND	--	1	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	1	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	1	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
10V	2-Chlorobethylvinyl Ether	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value -- Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis -- Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	1	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	1	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	1	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	1	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	1	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	1	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	1	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 313 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	3	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	3	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	3	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	3	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	3	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	3	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	3	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATIONApplicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power StationANALYSIS RESULTS TABLE POLLUTANT GROUP 3
MODULE 6

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 413 (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 3 Volitales		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1V	Acrolein	25	624	ND	--	ND	--	3	ug/L	lb/day	
2V	Acrylonitrile	25	624	ND	--	ND	--	3	ug/L	lb/day	
3V	Benzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
5V	Bromoform	5	624	ND	--	ND	--	3	ug/L	lb/day	
6V	Carbon Tetrachloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
7V	Chlorobenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
8V	Chlorodibromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
9V	Chloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
10V	2-Chloroethylvinyl Ether	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 3 Volatiles		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
11V	Chloroform	5	624	ND	--	ND	--	3	ug/L	lb/day	
12V	Dichlorobromomethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
14V	1,1-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
15V	1,2-Dichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
16V	1,1-Dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
17V	1,2 Dichloropropane	5	624	ND	--	ND	--	3	ug/L	lb/day	
18V	1, 3-Dichloropropylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
19V	Ethylbenzene	5	624	ND	--	ND	--	3	ug/L	lb/day	
20V	Methyl Bromide	5	624	ND	--	ND	--	3	ug/L	lb/day	
21V	Methyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
22V	Methylene Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	
23V	1,1,2,2-Tetrachloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
24V	Tetrachloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
25V	Toluene	5	624	ND	--	ND	--	3	ug/L	lb/day	
26V	1,2-Trans-dichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
27V	1,1,1-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
28V	1,1,2-Trichloroethane	5	624	ND	--	ND	--	3	ug/L	lb/day	
29V	Trichloroethylene	5	624	ND	--	ND	--	3	ug/L	lb/day	
31V	Vinyl Chloride	5	624	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number 001 (Show location of sampling point on Line Drawing);
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Upstream Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used.	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	—	ND	—	3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	—	ND	—	3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
10A	Phenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☒ Intake Sampling Results - Optional (Specify Source: Ohio River)
- ☐ Upstream Background Sampling Results - Optional (Specify Location: ____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND		ND		3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND		ND		3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND		ND		3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND		ND		3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND		ND		3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND		ND		3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND		ND		3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND		ND		3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND		ND		3	ug/L	lb/day	
10A	Phenol	10	625	ND		ND		3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND		ND		3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4 MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: ____)
☐ Upstream Background Sampling Results - Optional (Specify Location: ____)
☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 101
☐ New Discharge (Basis for Information: ____)
☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c.			
				Concentration	Mass	Concentration	Mass	Number of Analysis	Concentration	Mass	
1A	2-Chlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	—	ND	—	1	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	—	ND	—	1	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
10A	Phenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 101 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Upstream Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (ug/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	--	ND	--	3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	--	ND	--	3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
10A	Phenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number: _____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: _____)
- ☐ Upstream Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 103
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	--	ND	--	1	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	--	ND	--	1	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
10A	Phenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value.— Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis.— Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 103 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Upstream Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	--	ND	--	3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	--	ND	--	3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
10A	Phenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Upstream Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 303
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	—	ND	—	1	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	—	ND	—	1	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
10A	Phenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.											
APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station											
<input checked="" type="checkbox"/> Outfall Number Internal Monitoring Point 303 (Show location of sampling point on Line Drawing) <input type="checkbox"/> Intake Sampling Results - Optional (Specify Source: _____) <input type="checkbox"/> Upstream Background Sampling Results - Optional (Specify Location: _____) <input type="checkbox"/> Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) <input type="checkbox"/> New Discharge (Basis for Information: _____) <input type="checkbox"/> Bypass or Sewer System Overflow (Describe: _____)											
POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present				4. Units		5. Coefficient of Effluent Variability (CV)	
				a. Max Daily Value		b. Average of Analysis					c. Number of Analysis
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1A	2-Chlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	—	ND	—	3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	—	ND	—	3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
10A	Phenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Upstream Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 111
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1A	2-Chlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	--	ND	--	1	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	--	ND	--	1	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
10A	Phenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station.

- ☒ Outfall Number Internal Monitoring Point 111 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Upstream Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units*		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1A	2-Chlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	—	ND	—	3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	—	ND	—	3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
10A	Phenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Upstream Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 211
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L.)	2. EPA. Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent - Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	—	ND	—	1	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	—	ND	—	1	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	—	ND	—	1	ug/L	lb/day	
10A	Phenol	10	625	ND	—	ND	—	1	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	—	ND	—	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 211 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Upstream Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	—	ND	—	3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	—	ND	—	3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	—	ND	—	3	ug/L	lb/day	
10A	Phenol	10	625	ND	—	ND	—	3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	—	ND	—	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Intake Sampling Results - Optional (Specify Source: ____)
- ☐ Upstream Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 313
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 4. Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	--	ND	--	1	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	--	ND	--	1	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	--	ND	--	1	ug/L	lb/day	
10A	Phenol	10	625	ND	--	ND	--	1	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	--	ND	--	1	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 313 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Upstream Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	--	ND	--	3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	--	ND	--	3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
10A	Phenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

ANALYSIS RESULTS TABLE POLLUTANT GROUP 4
MODULE 7

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 413 (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results - Optional (Specify Source: _____)
☐ Upstream Background Sampling Results - Optional (Specify Location: _____)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ New Discharge (Basis for Information: _____)
☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 4 Acid Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max-Daily Value		b. Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1A	2-Chlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
2A	2,4-Dichlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
3A	2,4-Dimethylphenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
4A	4,6-Dinitro-o-cresol	50	625	ND	--	ND	--	3	ug/L	lb/day	
5A	2,4-Dinitrophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
6A	2-Nitrophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
7A	4-Nitrophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
8A	P-chloro-m-cresol	10	625	ND	--	ND	--	3	ug/L	lb/day	
9A	Pentachlorophenol	50	625	ND	--	ND	--	3	ug/L	lb/day	
10A	Phenol	10	625	ND	--	ND	--	3	ug/L	lb/day	
11A	2,4,6-Trichlorophenol	10	625	ND	--	ND	--	3	ug/L	lb/day	

3. If other data is available (i.e., DMR data, etc.), the past year of data may be used to determine 3a, 3b, 3c, and 5.

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

Applicant Name: First Energy Nuclear Operating
Company (FENOC) Beaver Valley Power StationCOMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATIONANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number, ____ (Show location of sampling point on Line Drawing)
- ☒ Water Supply Sampling Results - Optional (Specify Source: Ohio River)
- ☐ Background Sampling Results - Optional (Specify Location: ____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1B	Acenaphthene	10	625	ND		ND		3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND		ND		3	ug/L	lb/day	
3B	Anthracene	10	625	ND		ND		3	ug/L	lb/day	
4B	Benzidine	50	625	ND		ND		3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND		ND		3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND		ND		3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND		ND		3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND		ND		3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND		ND		3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND		ND		3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND		ND		3	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND		ND		3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND		ND		3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND		ND		3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND		ND		3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND		ND		3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND		ND		3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
18B	Chrysene	10	625	ND		ND		3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND		ND		3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND		ND		3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND		ND		3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND		ND		3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND		ND		3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND		ND		3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND		ND		3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND		ND		3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND		ND		3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND		ND		3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND		ND		3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND		ND		3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND		ND		3	ug/L	lb/day	
32B	Fluorene	10	625	ND		ND		3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND		ND		3	ug/L	lb/day	
34B	Hexechlorobutadiene	10	625	ND		ND		3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND		ND		3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND		ND		3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND		ND		3	ug/L	lb/day	
38B	Isophorone	10	625	ND		ND		3	ug/L	lb/day	
39B	Naphthalene	10	625	ND		ND		3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND		ND		3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND		ND		3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND		ND		3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND		ND		3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND		ND		3	ug/L	lb/day	
45B	Pyrene	10	625	ND		ND		3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND		ND		3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ **Outfall Number 001** (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1B	Acenaphthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
18B	Chrysene	10	625	ND	--	ND	--	3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
34B	Hexechlorobutadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	3	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	

- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 101
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analyls			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1B	Acenaphthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	1	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	1	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	1	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	1	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA . Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
18B	Chrysene	10	625	ND	--	ND	--	1	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	1	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	1	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	1	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
34B	Hexechlorobutadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	1	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	1	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value -- Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis -- Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 101 (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1B	Acenaphthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value -- Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis -- Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (ug/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
18B	Chrysene	10	625	ND	--	ND	--	3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
34B	Hexachlorobutadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	3	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value -- Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis -- Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 103
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1B	Acenaphthene	10	625	ND	—	ND	—	1	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	—	ND	—	1	ug/L	lb/day	
3B	Anthracene	10	625	ND	—	ND	—	1	ug/L	lb/day	
4B	Benzidine	50	625	ND	—	ND	—	1	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	—	ND	—	1	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	—	ND	—	1	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	—	ND	—	1	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	—	ND	—	1	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	—	ND	—	1	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	—	ND	—	1	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	—	ND	—	1	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	—	ND	—	1	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	—	ND	—	1	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	—	ND	—	1	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	—	ND	—	1	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	—	ND	—	1	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	—	ND	—	1	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
18B	Chrysene	10	625	ND	--	ND	--	1	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	1	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	1	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	1	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
34B	Hexachlorobutadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	1	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	1	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 103 (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysls			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1B	Acenaphthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
18B	Chrysene	10	625	ND	--	ND	--	3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
34B	Hexechlorobutadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	3	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	

- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 303
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1B	Acenaphthene	10	625	ND	—	ND	—	1	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	—	ND	—	1	ug/L	lb/day	
3B	Anthracene	10	625	ND	—	ND	—	1	ug/L	lb/day	
4B	Benzidine	50	625	ND	—	ND	—	1	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	—	ND	—	1	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	—	ND	—	1	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	—	ND	—	1	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	—	ND	—	1	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	—	ND	—	1	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	—	ND	—	1	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	—	ND	—	1	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	—	ND	—	1	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	—	ND	—	1	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	—	ND	—	1	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	—	ND	—	1	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	—	ND	—	1	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	—	ND	—	1	ug/L	lb/day	

3.a. Maximum Daily Value — Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis — Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
18B	Chrysene	10	625	ND	--	ND	--	1	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	1	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	1	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	1	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
34B	Hexachlorobutadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	1	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	1	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

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COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 303 (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1B	Acenaphthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3-Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
18B	Chrysene	10	625	ND	--	ND	--	3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
34B	Hexachlorobutadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	3	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	

- 3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
 3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.
 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number ____ (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: ____)
- ☐ Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 111.
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1B	Acenaphthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	1	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	1	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	1	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	1	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
12B	Bis(2-Chloro-isopropyl)ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
18B	Chrysene	10	625	ND	--	ND	--	1	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	1	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	1	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	1	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
34B	Hexechlorobutadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	1	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	1	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 111 (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1B	Acenaphthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	

- 3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

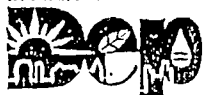
POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
18B	Chrysene	10	625	ND	--	ND	--	3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
34B	Hexachlorobutadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	3	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number: ____ (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: ____)
- ☐ Background Sampling Results - Optional (Specify Location: ____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 211
- ☐ New Discharge (Basis for Information: ____)
- ☐ Bypass or Sewer System Overflow (Describe: ____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1B	Acenaphthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	1	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	1	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	1	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	1	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
18B	Chrysene	10	625	ND	--	ND	--	1	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	1	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	1	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	1	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
34B	Hexachlorobutadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	1	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	1	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value-- Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis -- Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 211 (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1B	Acenaphthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (ug/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
18B	Chrysene	10	625	ND	--	ND	--	3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
34B	Hexachlorobutadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	3	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☐ Outfall Number _____ (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☒ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing) Influent to Internal Monitoring Point 313
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
1B	Acenaphthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	1	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
4B	Benidine	50	625	ND	--	ND	--	1	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	1	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	1	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
12B	Bis(2-Chloro-Isopropyl)ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	1	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
18B	Chrysene	10	625	ND	--	ND	--	1	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	1	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	1	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	1	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	1	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	1	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	1	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	1	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
34B	Hexachlorobutadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	1	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	1	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	1	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	1	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	1	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	1	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	1	ug/L	lb/day	

3.a. Maximum Daily Value— Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis — Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME: FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 313 (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1B	Acenaphthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
12B	Bis(2-Chloro-isopropyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, intake water and background.

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POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (ug/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability - (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
18B	Chrysene	10	625	ND	--	ND	--	3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
34B	Hexechlorobutadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	3	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.



Applicant Name: First Energy Nuclear Operating Company (FENOC) Beaver Valley Power Station

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

ANALYSIS RESULTS TABLE POLLUTANT GROUP 5
MODULE 8

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

- ☒ Outfall Number Internal Monitoring Point 413 (Show location of sampling point on Line Drawing)
- ☐ Water Supply Sampling Results - Optional (Specify Source: _____)
- ☐ Background Sampling Results - Optional (Specify Location: _____)
- ☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
- ☐ New Discharge (Basis for Information: _____)
- ☐ Bypass or Sewer System Overflow (Describe: _____)

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass		Concentration	Mass	
1B	Acenaphthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
2B	Acenaphthylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
3B	Anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
4B	Benzidine	50	625	ND	--	ND	--	3	ug/L	lb/day	
5B	Benzo(a)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
6B	Benzo(a)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
7B	3,4-Benzofluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
8B	Benzo(ghi)perylene	10	625	ND	--	ND	--	3	ug/L	lb/day	
9B	Benzo(k)fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
10B	Bis(2-Chloro-ethoxy)methane	10	625	ND	--	ND	--	3	ug/L	lb/day	
11B	Bis(2-Chloroethyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
12B	Bis(2-Chloro-isopropyl)ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
13B	Bis(2-Ethylhexyl)phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
14B	4-Bromophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	
15B	Butylbenzyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
16B	2-Chloronaphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
17B	4-Chlorophenyl Phenyl Ether	10	625	ND	--	ND	--	3	ug/L	lb/day	

- 3.a. Maximum Daily Value - Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.
- 3.b. Average of Analysis - Determine the average of all samples taken within the past year. Report both mass and concentration.
- 3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility Influent, Intake water and background.

It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

POLLUTANT GROUP 5 Base Compounds		1. MDL Used* (µg/L)	2. EPA Method Number Used	3. Level Present					4. Units		5. Coefficient of Effluent Variability (CV)
				a. Max Daily Value		b. Annual Average of Analysis		c. Number of Analysis			
				Concentration	Mass	Concentration	Mass				
18B	Chrysene	10	625	ND	--	ND	--	3	ug/L	lb/day	
19B	Dibenzo(a,h)anthracene	10	625	ND	--	ND	--	3	ug/L	lb/day	
20B	1,2-Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
21B	1,3- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
22B	1,4- Dichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
23B	3,3'-Dichlorobenzidine	20	625	ND	--	ND	--	3	ug/L	lb/day	
24B	Diethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
25B	Dimethyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
26B	Di-n-butyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
27B	2,4-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
28B	2,6-Dinitrotoluene	10	625	ND	--	ND	--	3	ug/L	lb/day	
29B	Di-n-octyl Phthalate	10	625	ND	--	ND	--	3	ug/L	lb/day	
30B	1,2-Diphenylhydrazine (as Azobenzene)	50	625	ND	--	ND	--	3	ug/L	lb/day	
31B	Fluoranthene	10	625	ND	--	ND	--	3	ug/L	lb/day	
32B	Fluorene	10	625	ND	--	ND	--	3	ug/L	lb/day	
33B	Hexachlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
34B	Hexechlorobutadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
35B	Hexachlorocyclopentadiene	10	625	ND	--	ND	--	3	ug/L	lb/day	
36B	Hexachloroethane	10	625	ND	--	ND	--	3	ug/L	lb/day	
37B	Indeno(1,2,3-cd)pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
38B	Isophorone	10	625	ND	--	ND	--	3	ug/L	lb/day	
39B	Naphthalene	10	625	ND	--	ND	--	3	ug/L	lb/day	
40B	Nitrobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	
41B	N-Nitrosodimethylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
42B	N-Nitrosodi-n-propylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
43B	N-Nitrosodiphenylamine	10	625	ND	--	ND	--	3	ug/L	lb/day	
44B	Phenanthrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
45B	Pyrene	10	625	ND	--	ND	--	3	ug/L	lb/day	
46B	1,2,4-Trichlorobenzene	10	625	ND	--	ND	--	3	ug/L	lb/day	

3.a. Maximum Daily Value – Report the highest daily value or daily average value from the last year of data. Report both mass and concentration.

3.b. Average of Analysis – Determine the average of all samples taken within the past year. Report both mass and concentration.

3.c. A minimum of 3 Sampling Events required for process wastewater discharges, and a minimum of 1 Sampling Event for all other discharges, treatment facility influent, intake water and background.

* It is in the applicant's interest to achieve the lowest level of detection possible. This will minimize uncertainty and therefore the need for additional analysis or the potential for establishing a large number of effluent limits and/or monitoring requirements in the final NPDES permit.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

[illegible]

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	Intake
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2. Other Chemicals

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	001
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Decane			21	1/3
3	Nonane, 2,6-dimethyl-			7.3	1/3
3	Hexatriacontane			6.4	1/3
3	Decane			5.4	1/3
3	Cyclopentanol, 3-methyl-			3.1	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	Influent to Internal Monitoring Point 101
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Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	2,3-(Cyclopenten-3,5-diyl)-6,6-dimethylenebicyclo[3.3.0]octan-2-one			1.1	1/3
3	1-Buten-3-yne, 2-methyl-			0.52	1/3
3	2-(Ethoxycarbonyl)-2-propargylcyclopentanone			0.48	1/3

[illegible]

Provide additional sheets as necessary.

OTHER TOXIC CHEMICALS

MODULE 11

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	Internal Monitoring Point 101
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Dodecane, 4,6-dimethyl-			7.5	1/3
3	Decane, 3-methyl-			3.2	1/3
3	1-Octanol, 3-butyl-			2.9	1/3
3	Furan, 2,5-dihydro-			1.1	1/3
3	Naphthalene, 1-methyl-			3.4	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

OTHER TOXIC CHEMICALS

MODULE 11

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number Influent to Internal Monitoring Point 103

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	3-Monomethylamino-1,2,4-Triazine 1-Oxide			1.6	1/3
3	Chalcone			1.1	1/3
3	1,5-Hexadiyne			1.1	1/3
3	7(8H)-Pteridinone, 2-methyl-			0.73	1/3

[illegible]

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
Outfall Number	Internal Monitoring Point 103

1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Phenol			1.2	1/3
3	2-Butenedinitrile, (E)-			0.87	1/3
3	Heptane, 3,3,5-trimethyl-			4.6	1/3
3	Hexane			3.1	1/3
3	2-Octyn-1-ol			1.1	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

OTHER TOXIC CHEMICALS

MODULE 11

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number: Influent to Internal Monitoring Point 303

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	3-Octen-1-yne, (E)-			1.6	1/3
3	1-Buten-3-yne, 2-methyl-			1.1	1/3
3	1H-Imidazole, 2-ethenyl			0.77	1/3
3	Benzaldahyde, 3-nitro-			0.66	1/3
					/

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Power Plant (FENOC) - Beaver Valley Power Station
Outfall Number	Internal Monitoring Point 303

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Heptane, 3,3,5-trimethyl-			6.7	1/3
3	Cyclopentane, 1-hexyl-3-methyl-			4.9	1/3
3	Nonane, 2,6-dimethyl-			3.7	1/3
3	Phenol			0.93	1/3
3	1-Buten-3-yne, 2-methyl-			0.73	1/3

[illegible]

Provide additional sheets as necessary.

OTHER TOXIC CHEMICALS MODULE 11

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
Outfall Number	Influent to Internal Monitoring Point 111

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Decane, 4-methyl-			6.8	1/3
3	Octane, 2,6-dimethyl-			4.9	1/3
3	Cyclohexane, decly-			4	1/3
3	Heptane, 3-ethyl-2-methyl-			3.4	1/3
3	Pentanamide, 5-hydroxy-			3.4	1/3

[illegible]

Provide additional sheets as necessary.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

OTHER TOXIC CHEMICALS MODULE 11

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

Outfall Number	Internal Monitoring Point 111
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Decane			21	1/3
3	Undecane, 2,5-dimethyl-			6.8	1/3
3	Tridecane			5.4	1/3
3	Octane, 3,3-dimethyl-			6.3	1/3
3	Octane, 2,3,6-trimethyl-			7.1	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

OTHER TOXIC CHEMICALS MODULE 11

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
Outfall Number	Influent to Internal Monitoring Point 211

1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Benzaldehyde, 3-nitro-			0.82	1/3
3	Methane, dibromo-			1.1	1/3
3	1H-Imidazole, 2-ethenyl-			0.52	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	Internal Monitoring Point 211
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Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Decane			26	1/3
3	Nonane, 4,5-dimethyl-			11	1/3
3	Octane, 3,3-dimethyl-			8.6	1/3
3	1-Decene, 4-methyl-			7.8	1/3
3	Octane, 3,6-dimethyl-			6.9	1/3

[illegible]

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) Beaver Valley Power Station
Outfall Number	Influent to Internal Monitoring Point 313

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Decane, 2,5,6-trimethyl-			6.7	1/3
3	Undecane, 3,6-dimethyl-			6.6	1/3
3	Heptane, 3,3,5-trimethyl-			5.3	1/3
3	Cyclohexane, butyl-			4.9	1/3
3	Cyclohexane, 1-ethyl-2-methyl			4.6	1/3

[illegible]

Provide additional sheets as necessary.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station'
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Outfall Number	Internal Monitoring Point 413
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Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
3	Decane, 4-methyl-			5.5	1/3
3	1-Buten-3-yne, 2-methyl-			1.8	1/3
3	Pyrazine, methyl-			0.74	1/3

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) – Beaver Valley Power Station
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Outfall Number	Intake
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	1-Propanol, 2-(2-hydroxypropoxy)-			32	1/3
4-5	3-Hexenedinitrile			16	1/3
4-5	Ethanol, 2-(2-butoxyethoxy)		12.3	25	3/3
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate		123	160	3/3
4-5	2-Propanol, 1,1'-oxybis-			14	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
Outfall Number	001

1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	Ethanol, 2-(2-butoxyethoxy)-		28	45	3/3
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate		197	260	3/3
4-5	2-Propanol, 1,1'-oxybis-			15	1/3
4-5	1-Propanol, 2-(2-hydroxypropoxy)-		21	28	2/3
4-5	Ethanol, 2-butoxy-			12.8	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) – Beaver Valley Power Station
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Outfall Number	Influent to Internal Monitoring point 101
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	2-Propanol, 1,1'-oxybis-			29	1/3
4-5	1-Propanol, 2-(2-hydroxypropoxy)-			17	1/3
4-5	2-Propanol, 1,1'-[(methyl-1,			25	1/3
4-5	1-Buten-2,4-dicarbonitrile			13	1/3
4-5	9-Octadecenamide, (Z)-			35	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Operating Company (FENOC) - Beaver Valley Power Station
-----------------------	---

Outfall Number	Internal Monitoring Point 101
-----------------------	--------------------------------------

1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	Ethanol, 2-butoxy-			120	1/3
4-5	Pyrrolo[1,2-a]-1,3,5-triazine-			58	1/3
4-5	1-Tetracosanol			83	1/3
4-5	9-Octadecenamide, (Z)-		43	68	2/3
4-5	1-Propanol, 2-(2-hydroxypropoxy)-			32	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	Influent to Internal Monitoring Point 103
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Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	2-Propanol, 1,1'-oxybis-			8.6	1/3
4-5	1-Buten-2,4-dicarbonitrile			1.7	1/3
4-5	Ethanol, 2-(2-butoxyethoxy)-			2.9	1/3
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate			160	1/3
4-5	Dodecanamide			3.4	1/3

[illegible]

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	Internal Monitoring Point 103
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	Bis(1-methyl-2-hydroxyethyl)ether			30	1/3
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate		101	140	3/3
4-5	1-Propanol, 2-(2-hydroxypropoxy)-		19	23	2/3
4-5	Ethanol, 2-(2-butoxyethoxy)-		16	23	2/3
4-5	Methylene bisphenyl isocyanate			45	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	Influent to Internal Monitoring Point 303
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	2-Propanol, 1,1'-oxybis-			26	1/3
4-5	1-Buten-2,4-dicarbonitile			12	1/3
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate			270	1/3
4-5	Tridecane			2.5	1/3
4-5	9-Octadecenamide, (Z)-			37	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) – Beaver Valley Power Station
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Outfall Number	Internal Monitoring Point 111
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate		207	240	3/3
4-5	Octadecanoic acid		13	21	2/3
4-5	Hexadecanoic acid			21	1/3
4-5	2-Hexanol			42	1/3
4-5	trans-1,4-Dicyano-2-butene			14	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Outfall Number	Influent to Internal Monitoring Point 211
1	1
2	2
3	3
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90	90
91	91
92	92
93	93
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95	95
96	96
97	97
98	98
99	99
100	100

1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	1-Propanol, 2-(2-hydroxypropoxy)-			34	1/3
4-5	Benzenemethanamine, N,N-dimethyl-			24	1/3
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate			130	1/3
4-5	1H-Indol-5-ol			17	1/3
4-5	Caffeine			17	1/3

2. Other Chemicals

[illegible]

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) – Beaver Valley Power Station
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Outfall Number	Internal Monitoring Point 211
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate		257	330	3/3
4-5	Caffeine		10.5	16	3/3
4-5	2H-Indol-2-one, 1,3-dihydro-			100	1/3
4-5	Bis(1-methyl-2-hydroxyethyl)ether			31	1/3
4-5	3-Hexenedinitrile			15	1/3

2. Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

Applicant Name	FirstEnergy Nuclear Operating Company (FENOC) - Beaver Valley Power Station
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Outfall Number	Influent to Internal Monitoring Point 313
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1. GC/MS "Five Peaks" pollutants (see Appendix 1)

Group Number (3 - 6)	Chemical Substance or Compound Name	MDL (µg/L)	Average Effluent Concentration (µg/L)	Maximum Effluent Concentration (µg/L)	No. Samples Positive / No. analyzed
4-5	2-Propanol, 1-(2-methoxy-1-methylethoxy)-			9.0	1/3
4-5	2-Propanol, 1,1'-oxybis-			7.4	1/3
4-5	Phenol, 2-(1,1-dimethylethyl)-			7.0	1/3
4-5	Ethanol, 2-(2-butoxyethoxy)-, acetate			200	1/3
4-5	Benzoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-			36	1/3

Other Chemicals

[illegible]

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Before completing this form, read the step-by-step instructions provided in Appendix 1.

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

Provide additional sheets as necessary.

Provide additional sheets as necessary.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER STANDARDS AND FACILITY REGULATION

**STORMWATER
MODULE 12**

Before completing this form, read the step-by-step instructions provided in Appendix 1.

APPLICANT NAME First Energy Nuclear Operating Company (FENOC) - Beaver Valley Power Station

1. Site Plan and Stormwater Runoff. Attach a copy of your facility's site plan. (See instructions)

DEP strongly recommends the separation of stormwater and other wastewaters.

Please see Attachment 4: BVPS Stormwater Systems and Discharge Points (8700-DSK-0150 Rev. 2)

2. Description of Potential Pollutant Sources and Controls

a. For each stormwater outfall, provide an estimate of the area (include units) drained to the outfall, and a list of potential pollutant(s) and sources for the outfall.

Outfall Number	Total Area Drained (provide units)	Potential Pollutant(s) and Sources
003	495,225 Ft ²	
008	40,257 Ft ²	
011	315,667 Ft ²	
012	47,235 Ft ²	
013	134,830 Ft ²	
014	212,352 Ft ²	
015	58,008 Ft ²	
016	67,223 Ft ²	
017	31,490 Ft ²	
018	986,000 Ft ²	
019	1,796,000 Ft ²	

b. Describe Best Management Practices and nonstructural controls used to prevent potential pollutants in stormwater.

The BVPS Chemical Control Program contains elements, requirements, and responsibilities to prevent contamination or pollution of storm water runoff to which all employees are trained. Included on all BVPS-specific chemicals is a statement the reads, "DO NOT POUR DOWN ANY DRAINS." Procedural instructions also include guidance to minimize placing chemical containers near storm drains, and if temporary storage is unavoidable, to stage prevention and mitigation controls.

Stormwater source inspections conducted since 1996 and other surveillances (e.g., monthly above ground tank inspections conducted since 1999), did not indicate storage of materials described that would cause exposure to the stormwater at Beaver Valley Power Station as described.

- c. For each stormwater outfall, provide the location and description of existing structural control measures to reduce pollutants in stormwater runoff; and a description of the treatment the stormwater receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.

Outfall Number	Control Measures

3. Non-stormwater Discharges

- a. All non-stormwater discharges from these outfall(s) are identified in the Industrial Wastewater section of this application for the outfall.

☒ YES ☐ NO

- b. Provide a description of the method used, the date of any testing, and the on-site drainage points that were directly observed during a test.

4. Significant Leaks or Spills

Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last 3 years, including the approximate date and location of the spill or leak, and the type and amount of material released.

Please see Attachment 5: BVPS Spill History, 6/16/06

5. PREPAREDNESS, PREVENTION, AND CONTINGENCY (PPC) PLANNING.

Does the facility have a PPC plan?

☒ YES ☐ NO

Does the facility have any other related plans, such as a Pollution Incident Prevention (PIP) Plan, Spill Prevention Control and Counter Measure (SPCC) Plan or Stormwater BMP Plan?

☒ YES ☐ NO

If "YES," identify and indicate date(s) implemented.

Type of Plan	Date Implemented
FirstEnergy Nuclear Operating Company (FENOC), Beaver Valley Power Station, Environmental Emergency Response Plan	December 2005

DEP may require the plan(s) be submitted with this application.

6. Additional Stormwater Information Submission

- a. Could all sampling be performed as required?

☐ YES ☒ NO

(Explain below)

Stormwater Sampling results will follow this application.

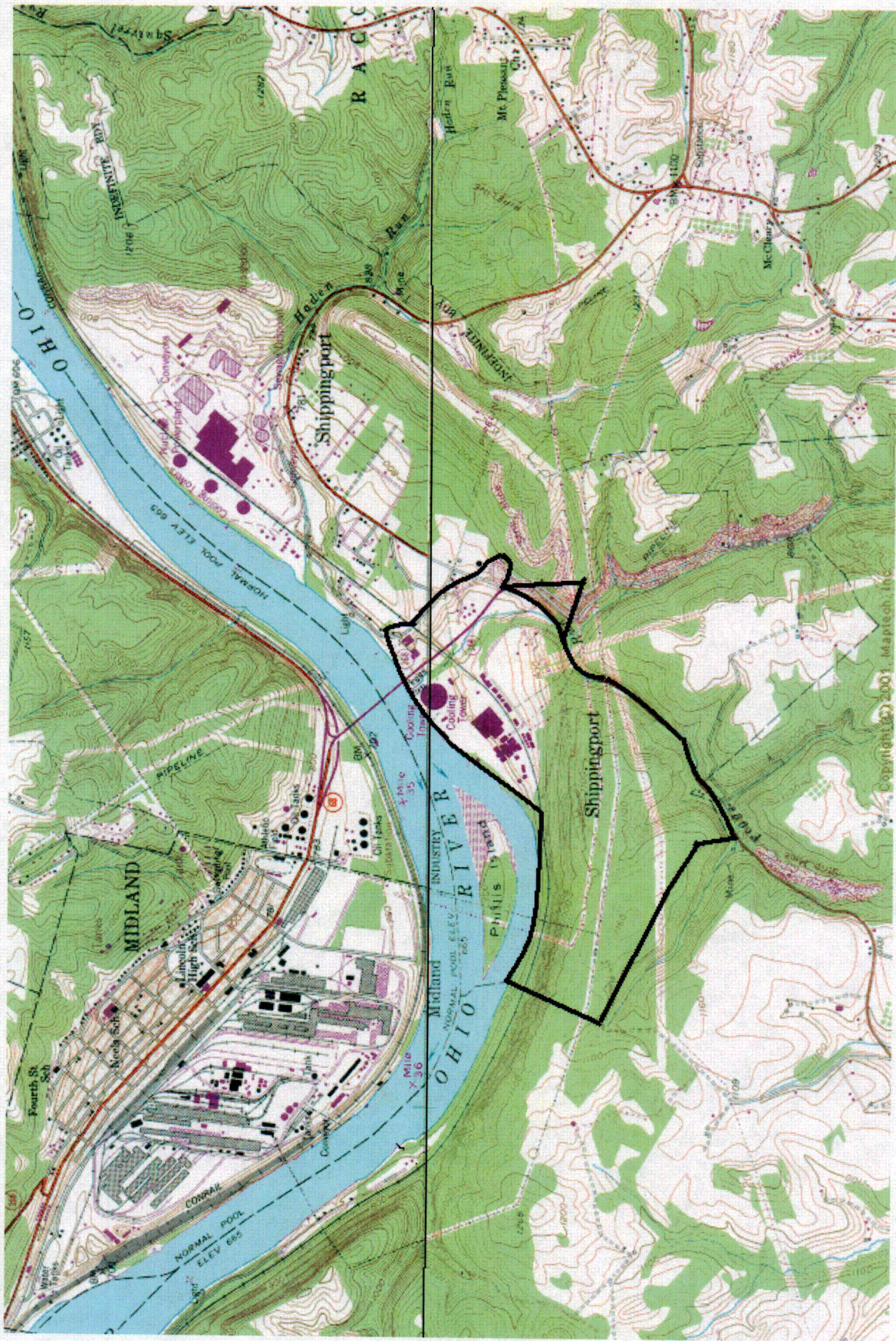
- b. Complete a Stormwater Sampling Data Table (Module 13) for each outfall containing stormwater. Indicate the total number of tables submitted.

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List of Attachments

- Attachment 1: Topographic Map
- Attachment 2: Waste Water Flow Diagram
- Attachment 3: Chemical Additive List
- Attachment 4: BVPS Stormwater Systems and Discharge Points
- Attachment 5: BVPS Spill History
- Attachment 6: County and Borough Notifications
- Attachment 7: MSDS Sheets for Chemical Additives

Attachment 1
Topographic Map



**THIS PAGE IS AN
OVERSIZED DRAWING OR
FIGURE,
THAT CAN BE VIEWED AT THE
RECORD TITLED:**

**DRAWING NO.: 8700-RM-27F,
“WASTE WATER
FLOW DIAGRAM”,
REV. 14**

**WITHIN THIS PACKAGE... OR,
BY SEARCHING USING THE
DOCUMENT/REPORT
SKETCH NO. 8700-RM-27F, REV. 14**

D-01

CHEMICAL ADDITIVE LIST

CHEMICAL ADDITIVES UTILIZED	USE/SYSTEM	USAGE RATE	IN-STREAM CONCENTRATION	CONDITIONED WATER DISCHARGE RATE	DISCHARGE OUTFALL NO.
Hydrazine , 35% (e.g. GE Betz Control OS5010)	Oxygen control of the secondary system (condensate)	1-40 gallons/day	10-300 ppb	Secondary System capacity 240,000-600,000 gallons (rate varies up to 0.600 mgd)	Periodic draining for maintenance, system leakage; maybe discharged after ion-exchange or neutralization 101/001/004 303/403/003 111/211/011 313/013
	Oxygen control of Chilled Water system and Hot Water Heat systems	<1 gallon/day	0.5-50 ppm	Not normally discharged.	Closed system normally no discharge unless system fails (e.g., tube leakage); periodic drain of system may be discharged after ion-exchange or neutralization 101/001/004 303/403/003 211/011 313/013
	Oxygen control of the Ecolochem reverse osmosis unit	<1 gallon/day	0.0 ppm	0.144 mgd	No un-reacted hydrazine is discharged
	Oxygen control of the steam generators during periods of wet lay-up	1 – 120 gallons/day	0.5 – 5 ppm	Secondary System capacity 240,000-600,000 gallons (rate varies up to 0.600 mgd)	Periodic drain during outages of approximately 30,000 gallons 101/001/004 303/403/003 111/211/011 313/013
	Oxygen control of the Auxiliary boilers also includes periods of wet lay-up/	1-120 gallons/day	0 – 200 mg/l	0.002 mgd	301/401/001

CHEMICAL ADDITIVE LIST

CHEMICAL ADDITIVES UTILIZED	USE/SYSTEM	USAGE RATE	IN-STREAM CONCENTRATION	CONDITIONED WATER DISCHARGE RATE	DISCHARGE OUTFALL NO.
Sodium Hydroxide (20-50% Caustic)	pH neutralization for the Unit 1 Chemical Waste Sump	<1 gal/day	5% - 20%	0.252 mgd	101/001/004/003/011/013
	Nuclear quench spray system (nuclear safety contingency) Not normally discharged.	<1 gal/day	20 – 26%	Not normally discharged	
	Closed Loop cooling systems for pH control	<1 gal/day	< 1 ppm	Not normally discharged	Closed loop system, leakage due to mechanical failure 303/403/003 111/211/011 313/013
Sulfuric Acid	pH neutralization of chemical waste sump	<1 gal/day	2-6%	0.252 mgd	101/001/004
	pH control of the Ecolochem reverse osmosis unit	<1 gal/day	1-5%	0.144 mgd	103/003
Sodium Bisulfite (e.g. GE Betz Spectrus DT1404)	Dechlorinating agent for circulating water system	0-500 pounds/day	0.0 – 5 ppm	40.0 mgd	001/004/010
Sodium Bromide (e.g. GE Betz Spectrus OX1201)	Biocide for the Circulating Water system	2,275 pounds/day	0.0 – 1.0 ppm	32.36 MGD avg. 61.2 MGD max	001/004/010
Aluminum Sulfate	Flocculant for Ecolochem reverse osmosis unit	1 lb/day	1-10 ppm	0.144 mgd	103/003
Cationic Polymer (e.g., GE Betz Polyfloc IC1181)	Coagulant (cationic) for the clarifier	120 lbs/day	17 ppm	0.330 mgd	103/003
Anionic Polymer (e.g., GE Betz Polyfloc API100)	Flocculent (anionic) for the clarifier	2 lbs/day	0.5 ppm	0.330 mgd	103/003
Sodium Hypochlorite	Biocide for the circulating water system	0-600 gallons/day (per unit)	0.0-2.0 ppm	40.0 mgd	001/004/010
	Disinfectant for sewage treatment plants	Up to 2 pound/day	0.0-1.0 ppm	0.014 mgd (Unit 1) 0.046 mgd (Unit 2)	203/003 113/013
	Periodic oxidation of hydrazine in chemical waste sump and condensate blowdown	50 gallons/day (during oxidation)	0.0-0.5 ppm	0.252 mgd (Chem Waste Sump) 0.488 mgd (SW Circ Pit)	101/001 403/003
Calcium Hypochlorite	Disinfectant for sewage treatment plants	Up to 2 pound/day	0.0-1.0 ppm	0.014 mgd (Unit 1) 0.046 mgd (Unit 2)	203/003 113/013

CHEMICAL ADDITIVE LIST

CHEMICAL ADDITIVES UTILIZED	USE/SYSTEM	USAGE RATE	IN-STREAM CONCENTRATION	CONDITIONED WATER DISCHARGE RATE	DISCHARGE OUTFALL NO.
Sodium Molybdate (e.g., GE Betz Corshield MD4103)	Corrosion control of the primary and secondary (i.e., CCT, CCP, etc.), ERF HVAC, Chilled Water, emergency diesel generator Closed Loop Cooling Systems, and security emergency diesel generator closed loop cooling systems	5000 lbs/year	200-1500 ppm	Not normally discharged.	Closed loop system, leakage due to mechanical failure 101/001 303/403/003 111/211/011 313/013
Ethanolamine (e.g. GE Betz Steamate PWR1440)	pH control of the Chilled Water and Hot Water Heat systems	<1 gal/day	0.5-50 ppm	Not normally discharged.	Closed system normally no discharge, however periodic drain of system is discharged after ion-exchange or neutralization 101/001/004 303/403/003 111/211/011 313/013
	PH control for the steam generators during periods of wet lay-up	1 – 15 gallons/day	0.5 – 5 ppm	Secondary System capacity 240,000-600,000 gallons (rate varies up to 0.600 mgd)	Periodic drain during outages of approximately 30,000 gallons 101/001/004 303/403/003 111/211/011 313/013
	pH and corrosion control of the secondary systems (condensate)	1 – 30 gallons/day	0.5 – 5 ppm	Secondary System capacity 240,000-600,000 gallons (rate varies up to 0.600 mgd)	Secondary System normal leakage and periodic drain for maintenance produces discharge 101/001/004 303/403/003 211/011 313/013
	pH control of the Auxiliary boiler – includes periods of wet layup.	1 – 30 gallons/day	0.5 – 5 ppm	0.002 mgd	301/401/001

CHEMICAL ADDITIVE LIST

CHEMICAL ADDITIVES UTILIZED	USE/SYSTEM	USAGE RATE	IN-STREAM CONCENTRATION	CONDITIONED WATER DISCHARGE RATE	DISCHARGE OUTFALL NO.
Sodium Nitrite (e.g. GEBetz Corrshield NT4203)	Corrosion control of the primary and secondary (i.e., CCT, CCP, etc.), ERF HVAC, Chilled Water, emergency diesel generator Closed Loop Cooling Systems, and security emergency diesel generator closed loop cooling systems	2,500 lbs/year	200-1500 ppm	Not normally discharged	Closed loop system, leakage due to mechanical failure 101/001 303/403/003 111/211/011 313/013
Surfactant (e.g. GE Betz Spectrus BD1500)	Biocide enhancer for microbiological control for the circulating water system	9,951 lbs/day	40 ppm	40.0 mgd	001/004/010
Non Oxidizing Biocide – Quaternary Ammonium Chloride (e.g. GE Betz Powerline 3627)	Biocide for macro fouling treatment for various river water, service water, and fire protection components and systems	Up to 3,000 lbs/day (4 times per subsystem per year)	2-12 ppm	40.0 mgd	001/004/010/003/011 Periodic drain of river and service water heat components, and fire protection pipes for maintenance produces discharge at: 303/003 111/211/011 313/013
Non Oxidizing Biocide – Quaternary Ammonium Chloride (e.g. GE Betz Powerline 3627)	Biocide for micro fouling treatment for various river water, service water, and fire protection components and systems	25-300 lbs/day	2-12 ppm	40.0 mgd	001/004/010/003/011 Periodic drain of river and service water heat components, and fire protection pipes for maintenance produces discharge at: 303/003 111/211/011 313/013
Non oxidizing biocide - Isothiazolin /BNPD (e.g., GE Betz Spectrus NX1100)	Corrosion control of the primary and secondary (i.e., CCT, CCP, etc.), ERF HVAC, and emergency diesel generator Closed Loop Cooling Systems	<1 lbs/day	15-30 ppm after addition	Not normally discharged	Closed loop system, leakage due to mechanical failure 101/001 303/403/003 111/211/011 313/013

CHEMICAL ADDITIVE LIST

CHEMICAL ADDITIVES UTILIZED	USE/SYSTEM	USAGE RATE	IN-STREAM CONCENTRATION	CONDITIONED WATER DISCHARGE RATE	DISCHARGE OUTFALL NO.
Corrosion Inhibitor (e.g., GE Betz Flogard MS6201)	Corrosion inhibitor for the circulating water system and secondary cooling system	600 lbs/day	1.54 ppm	40.0 mgd	001/004/010
Deposit Control Agent (e.g., GE Betz Depositrol BL5301, BL5303)	Deposit control inhibitor for the circulating water system	9,951 lbs/day	100 ppm	40.0 mgd	001/004/010
Copper Corrosion Inhibitor (e.g., GE Betz Inhibitor AZ8101)	Corrosion control of the primary and secondary (i.e., CCT, CCP, etc.), ERF HVAC, Chilled Water, and emergency diesel generator Closed Loop Cooling Systems	<55 gallons/day	10-100 ppm	Not normally discharged	Closed loop system, leakage due to mechanical failure 101/001 303/403/003 111/211/011 313/013
Bentonite Clay (Granules) Detoxifying Agent (e.g., GE Betz Spectrus DT1401)	Detoxifying clay for the biocide used for treating cooling water	21,000 lbs/day	0-35 ppm	40.0 mgd	001/004/010/011/003
Bentonite Clay (slurry) Detoxifying Agent (e.g. GE Betz Spectrus DT1400)	Detoxifying clay slurry for the biocide used for treating cooling water	21,000 lbs/day	15-35 ppm	40.0 mgd	001/004/010/011/003
Phosphate Based Corrosion Inhibitor (e.g., GE Betz Continuum AEC3145)	Corrosion inhibitor for the ERF cooling system	10 lbs/day	100 ppm	<0.001 mgd	012
Carbohydrazide (e.g., GE Betz Cortrol OS5613)	Oxygen control for the steam generators during periods of wet lay-up	170 gal/day	75-200 ppm in isolated components during outages	Secondary System capacity 240,000-600,000 gallons (rate varies up to 0.600 mgd)	Periodic drain during outages of approximately 30,000 gallons 101/001/004 303/403/003 111/211/011 313/013
Boric Acid	Neutron moderation through the reactor coolant system (RCS)	60,000 lbs/year	1-2,000 ppm	Closed loop system no discharge	Closed loop system no discharge
	Corrosion inhibitor in the Secondary system steam generators	2,000 lbs/year	1-50 ppm	Secondary System capacity 240,000-600,000 gallons (rate varies up to 0.600 mgd)	Secondary System normal leakage and periodic drains 101/001/004 303/403/003 211/011 313/013
	Reduce pH of condensate drainage	50 lbs/qtr	100-1000 ppm	<0.600 mgd	Secondary System normal leakage and periodic drains 101/001/004 303/403/003 211/011 313/013

CHEMICAL ADDITIVE LIST

CHEMICAL ADDITIVES UTILIZED	USE/SYSTEM	USAGE RATE	IN-STREAM CONCENTRATION	CONDITIONED WATER DISCHARGE RATE	DISCHARGE OUTFALL NO.
Non Oxidizing Biocide (e.g., GE Betz Spectrus NX118 (MBT))	Microbiological control for emergency diesel generator cooling system and ERF HVAC Closed Loop cooling systems	<1 gal/year	25 – 50 ppm	Not normally discharged	Closed loop system, leakage due to mechanical failure 101/001 303/403/003 111/211/011 313/013
Ethylene Glycol	Freeze protection for the ERF diesel generator cooling system	55 gal/year	45-70%	Not normally discharged (normally recycled offsite)	Closed system no discharge
	Glycol heating system, Glycol chilled water, Switchgear Cooling	330 gal/year	45-70%	Not normally discharged (normally recycled offsite)	Closed system no discharge
Anti-Foam (e.g., GE Betz Foamtrol CT, GE Betz Foamtrol AF1440)	Foam elimination in the liquid waste system, the sewage treatment plant, and circulating water systems	1,200 lbs/day	2.0 ppm	Variable	001/004/010 203/003 113/013
Ammonium Hydroxide	pH control for the secondary (condensate) system	< 1 gal/day under normal conditions	0.7-2.0 ppm	System capacity 240,000-600,000 gal	Secondary System normal leakage and periodic drains 101/001/004 303/403/003 111/211/011 313/013
		(15 gal to lay-up system)	10-50 ppm	Steam generator capacity 60,000 gal (rate varies up to 0.600 mgd)	
Ammonium Chloride	Molar Ratio control of secondary systems	< 1 lb/year	0 – 2.0 ppb	System capacity 240,000-600,000 gal	Secondary System normal leakage and periodic drains 101/001/004 303/403/003 111/211/011 313/013
Lithium Hydroxide (LiOH)	pH control for Reactor Coolant System	80 lbs/year	0.7/4.0 ppm	Not normally discharged	Closed loop system no discharge
	Tracer for Systems Diagnostics of the primary and secondary (i.e., CCT, CCP, etc.), and emergency diesel generator Closed Loop Cooling Systems	10 lbs/year	< 200 ppb		Closed loop system, leakage due to mechanical failure 101/001 303/403/003 111/211/011 313/013

CHEMICAL ADDITIVE LIST

CHEMICAL ADDITIVES UTILIZED	USE/SYSTEM	USAGE RATE	IN-STREAM CONCENTRATION	CONDITIONED WATER DISCHARGE RATE	DISCHARGE OUTFALL NO.
Hydrogen Peroxide (H2O2)	Corrosion control for the Reactor Coolant System	15.8 gal/18 months (10.6 gal/year)	1 ppm	System capacity 66,371 gal (up to .066 mgd)	Closed loop system no discharge
	Neutralization of the chemical waste sump and SW circ pit.	< 33 gallons/day	< 1 ppm	???	101/001 403/003
Zinc Acetate	Radiation dose control for the Reactor Coolant System	0.088 lbs/day (estimated average use rate)	0.035 ppm (estimated average in-stream)	System capacity 66,371 gal (up to .066 mgd)	Closed loop system no discharge
Hydrogen Nitrogen	Oxygen control for the Reactor Coolant System	As needed to maintain 20-30 psig overpressure in the volume control tank	30-40 cc/kg	System capacity 66,371 gal (up to .066 mgd)	Closed loop system no discharge
Potassium Chromate	Corrosion control for the Neutron Shield Tank at Unit 1 and Unit 2	<1 lbs/year	≤ 2,000 ppm	System capacity 20,970 gall (up to .021 mgd)	Closed system no discharge
Potassium Dichromate	pH control of the Neutron Shield Tanks at Unit 1 and Unit 2	<1 lbs/year	≤ 2,000ppm	System capacity 20,970 gall (up to .021 mgd)	Closed system no discharge
Sodium Bicarbonate	pH adjustment of the sewage treatment plant and various internal monitoring points.	50-150 lbs/day	10-300 ppm	0.014 mgd (Unit 1) 0.046 mgd (Unit 2)	103/203/303/003 111/211/011 113/313/013/ 114/014
Potassium hydroxide	Corrosion control of the primary and secondary (i.e., CCT, CCP, etc.), and emergency diesel generator Closed Loop Cooling Systems	< 5 pounds/year	As necessary to control pH	Not normally discharged	Closed loop system, leakage due to mechanical failure 101/001 303/403/003 111/211/011 313/013
Sodium Tetraborate	Corrosion control of the primary and secondary (i.e., CCT, CCP, etc.), and emergency diesel generator Closed Loop Cooling Systems	< 10 pounds/year	As necessary to control pH	Not normally discharged	Closed loop system, leakage due to mechanical failure 101/001 303/403/003 111/211/011 313/013

CHEMICAL ADDITIVE LIST

THE FOLLOWING CHEMICALS ARE USED FOR CORRECTIVE ACTION – NOT FOR NORMAL OPERATIONS

CHEMICAL ADDITIVES UTILIZED	USE/SYSTEM	USAGE RATE	IN-STREAM CONCENTRATION	CONDITIONED WATER DISCHARGE RATE	DISCHARGE OUTFALL NO.
Calcium Hydroxide (Hydrated Lime)	Maintained for emergency adjustments of various outfall pH's	Not normally used- rate dependant on contingency.	Variable	Variable	103/203/303/003 111/211//011 113/313/013
Liquid Live Organisms	Used to stimulate biological action in the sewage treatment plant system	500 ml/day	<1 ppm	Variable	203/003 113/013
Methanol (Fisher)	Used to stimulate biological growth on the rotating biological disk	300 ml/day	<1 ppm	Variable	203/003 113/013
Coagulation polymer (e.g. Photofloc 1132)	Used to assist in coagulation of solids	Variable	Variable	Variable	203/003 113/013
Fluorescein Dye	Dye testing	< 1 lbs/day)	1000 ppm	<0.060 mgd	003/008/011/012 /013
Bio-Remedial Cleaner/Degreaser (e.g., Fleetkleen)	Cleaning of transformers and surfaces.	< 50 gallons/year	N/A (not added to any system)	Not normally discharged	001, 003, 011, 013

**THIS PAGE IS AN
OVERSIZED DRAWING OR
FIGURE,**

**THAT CAN BE VIEWED AT THE
RECORD TITLED:**

**SKETCH NO.: 8700-DSK-0150,
“STORMWATER SYSTEMS AND
DISCHARGE PINTS EPA I.D.
#04-02474”,
REV. 2**

**WITHIN THIS PACKAGE... OR,
BY SEARCHING USING THE
DOCUMENT/REPORT
SKETCH NO. 8700-DSK-0150, REV. 2**

D-02X

B V P S SPILL HISTORY

Event Date	CR/Document Reference	Event Description	Impacted Region of Influence	Regulatory Notifications/Reports	Environmental Remedial/Corrective Actions
12/20/05	BVPS Condition Report 05-08062	Hydrazine was detected at Internal Monitoring Point 103. The cause was determined to be a loose fitting on a hydrazine container.	Outfall 003 IMP 103	BVPS immediately notified, by phone, the PA DEP upon confirmation of the condition. The required five-day follow-up written report was also submitted to PA DEP on December 23, 2005 under Letter No. L-05-205.	Corrective actions included replacement of the defective connection, and preventive maintenance and inspections specific to the connections.
7/22/04	BVPS Condition Reports 04-05870 04-05874	Approximately 3 gallons of diesel fuel were release to soil when the ERF Emergence Diesel Generator return piping was discovered to have been damaged. Notifications were made in accordance with 25 PA Code, Chapter 245.	No outfall was impacted.- paved and unpaved surface affected	Notifications were made in accordance with 25 PA Code 245.305. Corrective actions were documented and submitted as required in a SITE CHARACTERIZATION REPORT, STATEWIDE HEALTH STANDARDS, dated October 28, 2004.	The damage was due to excavation with a backhoe. The contaminated soil and area were handled in accordance with 25 PA Code, Chapter 245. The piping was repaired and tested by a certified handler.
1/17/03	BVPS Condition Report 03-00540	Approximately 750 gallons incompletely treated were released to the stormwater system from the Unit 2 Sewage Treatment Plant Secondary Clarifier from an open valve thought to be closed.	Outfall 013 Peggs Run	PA DEP (phone and written follow-up) and NRC awareness.	1) Directed cleanup by Mr. John of approximately 50 gallons of liquid that had not reached the stormwater system; 2) Cap with lanyards were attached to drains; 3) Numerous additional corrective Actions..
10/30/02	BVPS Condition Report 02-09734	Unit 2-2 EDG tank was overfilled allowing approximately 75 gallons to spill. An unknown quantity reached the Stormwater system.	Outfall 011 Ohio River	PA DEP (phone and written follow-up) and NRC awareness.	Procedure revisions and Human Performance remedial actions.
9/27/02	BVPS Condition Report 02-08413	Hold tank overflow due to power out on lift station, and warning indicator lights. Approximately 200 gallons reached the stormwater system.	Outfall 013 Peggs Run	The 24 hour report was made to Charles Brethauer of the state DEP.	1) Placed drain blockers over stormwater basins; 2) Directed cleanup by Mr. John.
1/30/02	BVPS Condition Report 02-00782	100 gallon diesel fuel oil spill to the ground in the area south of the Unit 2 Cooling Tower.	Parking lot surface Storm sewer system – Outfall 013- Pegg's Run Ohio River	NRC notified by BVPS via EN #38661 on 1/30/02 (event not reportable to NRC pursuant to 10 CFR 50.73). Report to PA DEP by BVPS on 2/5/02.	BVPS personnel with offsite assistance FROM THE Three Rivers Pollution Response Council (3PRC) contained and removed most of the spill that migrated from the parking lot to Pegg's Run. Nonetheless, some fuel oil entered the Ohio River.

June 13, 2006
L-06-107

Mr. William Green
Borough of Shippingport
P.O. Box 76
Shippingport, PA 15077

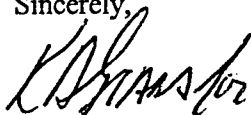
FirstEnergy Nuclear Operating Company Notice of Intent for NPDES Permit Renewal

Dear Mr. Green:

In accordance with Act 14 of the Commonwealth's Administrative Code, we are providing you notice that FirstEnergy Nuclear Operating Company (FENOC) will be submitting to the Pennsylvania Department of Environmental Protection (PA DEP), an application for our National Pollutants Discharge Elimination System (NPDES) permit (No. PA0025615). The current permit expires on December 27 of this year. Therefore, we will be submitting the renewal application by June 27, 2006.

Should you have any questions, please direct them to Mr. Michael Banko, at 724-682-4117.

Sincerely,



Richard G. Mende
Director, Site Operations

(NOTE: No new US NRC commitments are contained in this letter.)

cc: M. D. Banko
Central File: **Keyword- NPDES Act 14**

June 13, 2006
L-06-108

Beaver County Board of Commissioners
Mr. Daniel Donatella
810 Third Street
Beaver, PA 15009

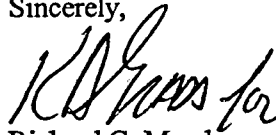
FirstEnergy Nuclear Operating Company Notice of Intent for NPDES Permit Renewal

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Richard G. Mende
Director, Site Operations

(NOTE: No new US NRC commitments are contained in this letter.)

cc: M. D. Banko
Central File: **Keyword- NPDES Act 14**

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. William Green
Borough of Shippingport
P. O. Box 76
Shippingport, PA 15077

2. Article Number
(Transfer from service label)

7005 1160 0002 0450 2074 1-06-107

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

COMPLETE THIS SECTION ON DELIVERY**A. Signature***William N. Green*

- ☐ Agent
☐ Addressee

B. Received by (Printed Name)

WILLIAM N. GREEN

C. Date of Delivery

06-14-06

- D. Is delivery address different from item 1?** ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

- 4. Restricted Delivery? (Extra Fee)** ☐ Yes

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. Dan Donatella
Beaver County Commissioners
Beaver County Courthouse
810 3rd Street
Beaver, PA 15009

2. Article Number
(Transfer from service label)

7005 1160 0002 0450 2050 1-06-108

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

COMPLETE THIS SECTION ON DELIVERY**A. Signature***X [Signature]*

- ☐ Agent
☐ Addressee

B. Received by (Printed Name)

WEESTER

C. Date of Delivery

6-15-06

- D. Is delivery address different from item 1?** ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

- ☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

- 4. Restricted Delivery? (Extra Fee)** ☐ Yes

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

69014779-1

EXPIRATION DATE: 10-NOV-2000
PRINTED DATE: 10-NOV-2000

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : CORTROL OS5010

**PRODUCT APPLICATION AREA: WATER BASED DISSOLVED OXYGEN
SCAVENGER/METAL PASSIVATOR.**

COMPANY ADDRESS:

BetzDearborn Inc.
4636 Somerton Road, Trevose, Pa. 19053
Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the
U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to
additional sections of this MSDS for our assessment of the potential
hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
302-01-2	HYDRAZINE Corrosive; highly toxic (by skin absorption); toxic (by ingestion); possible human carcinogen (IARC=2B; NTP=anticipated) and liver, kidney, blood or reproductive toxin

3) HAZARDS IDENTIFICATION

69014779-2

EMERGENCY OVERVIEW**DANGER**

Severe irritant to the skin. Absorbed by skin. Potential sensitizer. Corrosive to the eyes. Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

DOT hazard: Toxic

Emergency Response Guide #152

Odor: Ammonia; Appearance: Colorless To Light Brown Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS**ACUTE SKIN EFFECTS:**

Primary route of exposure; Toxic; Severe irritant to the skin. Absorbed by skin. Potential sensitizer.

ACUTE EYE EFFECTS:

Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:

Primary route of exposure; Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

Toxic;

May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.

TARGET ORGANS:

Repeated exposure may cause skin sensitization and/or toxicity to the liver, kidney, nervous system, and blood system. Component(s) may cause reproductive toxicity at maternal toxic levels. Limited evidence for increased risk of cancer.

MEDICAL CONDITIONS AGGRAVATED:

Pre-existing skin, liver or kidney disorders.

SYMPTOMS OF EXPOSURE:

Inhalation of vapors/mists/aerosols cause eye, nose, throat and lung irritation. Skin contact may cause redness, itching, dermatitis, or skin sensitization.

FIRST AID MEASURES

SKIN CONTACT:

URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.

EYE CONTACT:

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

MISCELLANEOUS:

Toxic

3293 ;Emergency Response Guide #152

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Isolate spill by diking. Dilute spill to a 5% or less concentration. Neutralize with an equal amount of a 5% or less concentration of a hypochlorite solution.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Basic. Vent slowly before opening. Do not mix with acidic material.

STORAGE:

Keep containers closed when not in use. Store in cool ventilated location. Store away from oxidizers.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

HYDRAZINE

PEL (OSHA): 1.0 PPM(SKIN)

TLV (ACGIH): 0.01 PPM(SKIN)-A3

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

An air-supplying respirator (positive pressure full facepiece) may be needed for this product.

SKIN PROTECTION:

gauntlet type butyl or PVC gloves, impervious full body protective suit, rubber boots-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles, face shield

PRODUCT NAME : CORTROL OS5010
EFFECTIVE DATE: 10-NOV-2000

69014779-5

PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.026	Vapor Pressure (mmHG)	18.0
Freeze Point (F)	< -30	Vapor Density (air=1)	1.00
Freeze Point (C)	< -34		
Viscosity (cps 70F, 21C)	10	% Solubility (water)	100.0
Odor	Ammonia		
Appearance	Colorless To Light Brown		
Physical State	Liquid		
Flash Point	P-M(CC)	> 200F > 93C	
pH 1% Sol. (approx.)	10.5		
Evaporation Rate (Ether=1)	< 1.00		

NA = not applicable ND = not determined

10) STABILITY AND REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	185 mg/kg
Reproductive Toxicity ANIMALS:	
NOTE - Effects only at maternal toxic levels	
Carcinogenicity ANIMALS:	Positive
NOTE - Suspect human carcinogen	
Dermal LD50 RABBIT:	420 mg/kg
Inhalation LC50 RAT:	1,600 ppm/4hr
Non-Ames Mutagenicity :	Positive

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

No Data Available.

BIODEGRADATION

No Data Available.

EFFECTIVE DATE: 10-NOV-2000

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
U133 = HYDRAZINE.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD:	Toxic
UN / NA NUMBER:	3293
DOT EMERGENCY RESPONSE GUIDE #:	152

15) REGULATORY INFORMATION**TSCA:**

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

0.3 gallons due to HYDRAZINE;

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

CAS#	CHEMICAL NAME
302-01-2	HYDRAZINE

SARA SECTION 313 CHEMICALS:

CAS#	CHEMICAL NAME
302-01-2	HYDRAZINE

RANGE
31.0-40.0%

CALIFORNIA REGULATORY INFORMATION**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

This product contains these chemicals known to the state of California to cause cancer or reproductive toxicity:

CAS#	CHEMICAL NAME
302-01-2	HYDRAZINE

MICHIGAN REGULATORY INFORMATION

CAS#	CHEMICAL NAME
302-01-2	HYDRAZINE

PRODUCT NAME : CORTROL OS5010
EFFECTIVE DATE: 10-NOV-2000

69014779-7

5) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	3	Serious Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	X	Ask Your Supervisor

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	26-OCT-2000		** NEW **
	10-NOV-2000	4	26-OCT-2000

69009131-1

CHEMPLY

Division of E + E (US) Inc.
P.O. Box 18049
Pittsburgh, PA 15236-0049

Phone: 412-384-5430
800-678-5480
Fax: 412-384-4050

Material Safety Data Sheet

Section 1: Product Identification

Product Name: • Caustic Soda, Liquid 20%
Chemical Name: Sodium Hydroxide, Aqueous
CAS Number: 1310-73-2
Synonyms: Lye
Formula: NaOH
Manufacturer: Chemply, Div. of E+E (US) Inc.
P.O. Box 18049
Pittsburgh, PA 15236
Phone: 412-384-5430
800-424-9300 - Chemtrec

Section 2: Composition

<u>Component</u>	<u>CAS No.</u>	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Sodium Hydroxide	1310-73-2	Both Limits are the same. Ceiling level is 2 mg/m ³ in air.	

Note: N/A = Not Applicable, N/K = Not Known, N/E = Not Established

Section 3: Hazards Identification

Routes of Exposure: Inhalation: Yes Skin: Yes Ingestion: Possible

69009131-2

Health Hazards (acute and Chronic):

Severe irritation to eyes, possible permanent damage and blindness. Irritant to skin and could cause severe burns. Ingestion may cause spasms, vomiting, tissue destruction and possible death. Inhalation may cause sore throat, coughing, shortness of breath.

Carcinogenity:NTP: NoIARC: NoOSHA: NoSigns and Symptoms of Exposure:

Sever irritation to eyes and skin. Vapors may cause irritation to nose, throat and respiratory tract. Severe burning pain in mouth, throat and abdomen. Other possible symptoms are vomiting and tissue perforation of the mucous membranes of the mouth, throat, esophagus and stomach.

Section 4: First-aid Measures

Ingestion: Give several glasses of tomato juice, orange juice, or water. Do not induce vomiting unless directed by a physician. If vomiting occurs give patient additional amounts of water. Do not give liquid to an unconscience patient.

Inhalation: Remove victim to fresh air. Administer artificial respiration if breathing is stopped.

Eyes: Flush eyes with large amounts of water for at least 15 minutes. Seek medical attention.

Skin: Wash affected area with large amounts of water.

Section 5: Fire-Fighting Measures

Flash point: N/A

Flammable Limits: (in air, % by vol.) LEL: N/A UEL: N/A

Extinguishing Media: Water fog, foam, dry chemical, CO₂

Special Fire Fighting Procedures: If water is sprayed on product, splattering may occur.

Unusual Fire and Explosion Hazards: Cool fire exposed containers.

Section 6: Accidental Release Measures

Steps to be taken if material is released or spilled:

Spills: For small spills absorb with vermiculite or other absorbent material. Large spills should be diked to prevent further spreading. Attempt to stop leak from source. Neutralization may be done by using dilute hydrochloric, sulfuric, or nitric solutions.

Waste Disposal Method: In accordance with federal, state, and local regulations.

Section 7: Handling and Storage

Precautions to be Taken in Handling and Storage:

Store product in a cool, dry area. Take precautions to avoid skin contact or inhalation of vapors.

Section 8: Exposure Controls/ Personal Protection

Engineering Controls: A local exhaust system should be adequate to prevent vapors from exceeding permissible exposure limits.

Personal Protection: Wear chemical resistant rubber gloves, goggles, apron, and face shield. Use self contained breathing apparatus or NIOSH approved respirator where exposure limits are exceeded.

Other Precautions: never touch eyes or face with hands or gloves in connect with caustic soda. Wash hands after use and before eating.

Section 9: Physical and Chemical Properties

Appearance: Clear liquid with no odor

Specific Gravity: 1.22

Vapor Pressure: 13 mm Hg @ 20 C

Evaporation Rate: N/K

Boiling Point: 229 F

Reactivity in Water: none

Solubility in Water: complete

Section 10: Stability and Reactivity

Stability: Stable

Incompatibility: Concentrated acids, magnesium, aluminum, zinc, tin, chromium, brass, bronze, and certain food sugars.

Hazardous Decomposition: Contact with certain food sugars produce carbon monoxide.

Hazardous Polymerization: Will not occur.

Section 11: Toxicological Information

Carcinogenicity: None

Other Toxicological Information: No data available.

Section 12: Ecological Information

No data available.

Section 13: Disposal Considerations

Waste Disposal Method: Dispose in accordance to federal, state, and local regulations.

Section 14: Transport Information

DOT Hazardous Material Classification: Sodium Hydroxide Solution
UN 1824 PG II
8(Corrosive)

Section 15: Regulatory Information

This product is not subject to the reporting requirements of Section 313 - Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 373.

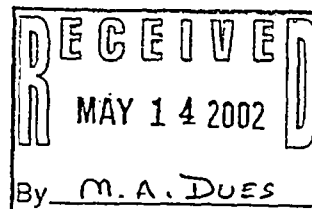
69009131-5

Section 16: Other Information

The information, data, and recommendations contained herein are believed to be accurate. Chemply makes no warranty of any kind and disclaims all liability from reliance thereon.

Material Safety Data Sheet

Sulfuric Acid



ACC# 22350

Section 1 - Chemical Product and Company Identification

MSDS Name: Sulfuric Acid

Catalog Numbers: S71211SC, S71826, S79200, S80213, S80213-1, A298 212, A298212, A300 212, A300 225LB, A300 500, A300 612GAL, A300 700LB, A300212, A300225LB, A300500, A300612GAL, A300700LB, A300C 212, A300C212, A300C212001, A300C212002, A300C212003, A300C212004, A300C212005, A300C212006, A300C212007, A300C212008, A300C212009, A300C212010, A300C212LC, A300FP 500, A300FP500, A300J500, A300P 500, A300P500, A300S 212, A300S 500, A300S212, A300S212LC, A300S500, A300SI 212, A300SI212, A468-1, A468-250, A468-500, A4682, A484 212, A484212, A510-212, A510-500, A510SK212, AC3000S212002, MAR77018068, NC9466102, NC9499595, NC9755547, NC9825433, NC9826713, S71211, S71211MF, S71211MF*, S71211SCMF, S71211SCMF*, S79200MF, S79200MF* DHAZ, S79200MF*DHAZ, S79200SCMF, SA174 212, SA174 4, SA174212, SA1744, SA176 4, SA1764, SA196 500, SA196500

Synonyms: Hydrogen Sulfate; Oil of Vitriol; Vitriol Brown Oil; Matting Acid; Battery Acid; Sulphuric Acid.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

RECEIVED

MAY 16 2002

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7664-93-9	Sulfuric acid	95-98.0	231-639-5

Hazard Symbols: C

Risk Phrases: 35 8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear colorless - oily liquid. **Danger!** Corrosive. Causes eye and skin burns. May cause severe respiratory tract irritation with possible burns. May cause severe digestive tract irritation with possible burns. Cancer hazard. May cause fetal effects based upon animal studies. May cause kidney damage. May be fatal if inhaled. May cause lung damage. Hygroscopic. Strong oxidizer. Contact with other material may cause a fire. May cause severe eye, skin and respiratory tract irritation with possible burns.

Target Organs: Kidneys, heart, lungs, respiratory system, cardiovascular system, teeth, eyes.

Potential Health Effects

Eye: Causes severe eye burns. May cause irreversible eye injury. May cause conjunctivitis. May cause permanent corneal opacification.

Skin: Causes skin burns. Continued contact can cause tissue necrosis. May cause skin rash (in milder cases), and cold and clammy skin with cyanosis or pale color.

Ingestion: May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. May cause systemic toxicity with acidosis.

Inhalation: May cause irritation of the respiratory tract with burning pain in the nose and throat, coughing, wheezing, shortness of breath and pulmonary edema. Causes chemical burns to the respiratory tract. Inhalation may be fatal as a result of spasm, inflammation, edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Causes corrosive action on the mucous membranes.

Chronic: Prolonged or repeated inhalation may cause kidney and lung damage. Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis. Prolonged or repeated eye contact may cause conjunctivitis. May cause fetal effects. May cause cancer in humans. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects. May cause ischemic heart lesions.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Monitor arterial blood gases, chest x-ray, and pulmonary function tests if respiratory tract irritation or respiratory depression is evident. Treat dermal irritation or burns with standard topical therapy. Effects may be delayed. Do NOT use sodium bicarbonate in an attempt to neutralize the acid.

Antidote: Do NOT use oils or ointments in eye.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Strong oxidizer. Contact with combustible materials may cause a fire. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Will react with water to form toxic and corrosive fumes. Contact with water can cause violent liberation of heat and splattering of the material. Some oxidizers may react explosively with hydrocarbons(fuel). Contact with metals may evolve flammable hydrogen gas. May accelerate burning if involved in a fire. Containers may explode when heated or if contaminated with water. Runoff from fire control or dilution

water may cause pollution.

Extinguishing Media: Do NOT use water directly on fire. Use carbon dioxide or dry chemical. Do NOT get water inside containers. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation. Use water spray to reduce vapors, do not put water directly on leak, spill area or inside container. Cover with dry earth, dry sand, or other non-combustible material followed with plastic sheet to minimize spreading and contact with water. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Do not ingest or inhale. Do not allow contact with water. Use only in a chemical fume hood. Discard contaminated shoes. Keep from contact with moist air and steam.

Storage: Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from water. Corrosives area. Do not store near alkaline substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Sulfuric acid	(1 mg/m ³) TWA; (3 mg/m ³) STEL	1 mg/m ³ TWA 15 mg/m ³ IDLH	1 mg/m ³ TWA

OSHA Vacated PELs: Sulfuric acid: 1 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: clear colorless - oily liquid
Odor: odorless
pH: 0.3 (1N Solution)
Vapor Pressure: 1 mm Hg @ 145.8 C
Vapor Density: 3.38
Evaporation Rate: Slower than ether.
Viscosity: 21 mPas @ 25 C
Boiling Point: 340 deg C
Freezing/Melting Point: 10.35 deg C
Autoignition Temperature: Not available.
Flash Point: Not available.
Decomposition Temperature: 340 deg C
NFPA Rating: (estimated) Health: 3; Flammability: 0; Reactivity: 2
Explosion Limits, Lower: Not available.
Upper: Not available.
Solubility: Soluble.
Specific Gravity/Density: 1.841
Molecular Formula: H₂SO₄
Molecular Weight: 98.0716

Section 10 - Stability and Reactivity

Chemical Stability: Combines vigorously with water with the evolution of heat. Reported to have exploded when in a sealed container. This was most likely due to pressure of hydrogen by reduction of water.

Conditions to Avoid: Incompatible materials, ignition sources, metals, excess heat, combustible materials, organic materials, reducing agents, exposure to moist air or water, oxidizers, amines, bases.

Incompatibilities with Other Materials: Bases, strong dehydrating agents, organic materials, finely powdered metals, moisture, carbides, chlorates, cyanides (e.g. potassium cyanide, sodium cyanide), azides, fulminates, picrates, nitrates, alkali halides, zinc, iodides, permanganates, hydrogen peroxides, perchlorates, nitromethane, phosphorus, nitrites, cyclopentadiene, cyclopentanone oxime, nitroaryl amines, lithium silicides, iron, mercuric nitride, benzene, potassium chlorates, steel, cesium acetylene carbide, trihydroxydiamino phosphate, phosphorus trioxide, reducing agents.

Hazardous Decomposition Products: Oxides of sulfur, irritating and toxic fumes and gases.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 7664-93-9: WS5600000

LD50/LC50:

CAS# 7664-93-9:

Draize test, rabbit, eye: 250 ug Severe;

Inhalation, mouse: LC50 = 320 mg/m³/2H;

Inhalation, rat: LC50 = 510 mg/m³/2H;

Oral, rat: LD50 = 2140 mg/kg;

Carcinogenicity:

CAS# 7664-93-9:

ACGIH: A2 - Suspected Human Carcinogen (contained in strong inorganic acid mists)

OSHA: Select carcinogen

IARC: Group 1 carcinogen

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Fish: Bluegill/Sunfish: 49 mg/L; 48Hr; TLm (tap water @ 20C)

Fish: Bluegill/Sunfish: 24.5 ppm; 48Hr; TLm (fresh water)

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	SULFURIC ACID				SULFURIC ACID
Hazard Class:	8				8(9.2)
UN Number:	UN1830				UN1830
Packing Group:	II				II

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 7664-93-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA**Section 302 (RQ)**

CAS# 7664-93-9: final RQ = 1000 pounds (454 kg)

Section 302 (TPQ)

CAS# 7664-93-9: TPQ = 1000 pounds; RQ = 1000 pounds

SARA Codes

CAS # 7664-93-9: acute, chronic, reactive.

Section 313

This material contains Sulfuric acid (CAS# 7664-93-9, 95 98 0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 7664-93-9 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 7664-93-9 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

C

Risk Phrases:

R 35 Causes severe burns.

R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 30 Never add water to this product.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7664-93-9: 2

Canada

CAS# 7664-93-9 is listed on Canada's DSL List. CAS# 7664-93-9 is listed on Canada's DSL List. This product has a WHMIS classification of E, D1A.

CAS# 7664-93-9 is listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 7664-93-9: OEL-ARAB Republic of Egypt:TWA 1 mg/m3 OEL-AUSTRALI
A:TWA 1 mg/m3 OEL-BELGIUM:TWA 1 mg/m3;STEL 3 mg/m3 OEL-CZECHOSLOVAKI
A:TWA 1 mg/m3;STEL 2 mg/m3 OEL-DENMARK:TWA 1 mg/m3 OEL-FINLAND:TWA 1
mg/m3;STEL 3 mg/m3;Skin OEL-FRANCE:TWA 1 mg/m3;STEL 3 mg/m3 OEL-GER
MANY:TWA 1 mg/m3 OEL-HUNGARY:STEL 1 mg/m3 OEL-JAPAN:TWA 1 mg/m3 OEL
-THE NETHERLANDS:TWA 1 mg/m3 OEL-THE PHILIPPINES:TWA 1 mg/m3 OEL-POL

AND:TWA 1 mg/m3 OEL-RUSSIA:STEL 1 mg/m3;Skin OEL-SWEDEN:TWA 1 mg/m3;
STEL 3 mg/m3 OEL-SWITZERLAND:TWA 1 mg/m3;STEL 2 mg/m3 OEL-THAILAND:T
WA 1 mg/m3 OEL-TURKEY:TWA 1 mg/m3 OEL-UNITED KINGDOM:TWA 1 mg/m3 OE
L IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEA
LAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 4/22/1999

Revision #7 Date: 11/20/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

MATERIAL SAFETY DATA SHEET

ISSUE DATE: 26-APR-2001

BetzDearborn, Division of Hercules Incorporated
4636 Somerton Road
Trevose, PA 19053
Business telephone: (215) 355-3300

HMIS RATINGS

(See Section 16 for
additional information)

EMERGENCY TELEPHONE (HEALTH/ACCIDENT)
(800) 877-1940 (USA)

HEALTH:
2

FLAMMABILITY:
0

REACTIVITY:
0

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

SPECTRUS DT1404

PRODUCT APPLICATION AREA:

CHEMICAL CLEANING COMPOUND.

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the
U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to
additional sections of this MSDS for our assessment of the potential
hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#

CHEMICAL NAME

7631-90-5

SODIUM BISULFITE

May be corrosive in aqueous solutions; irritant;
sensitizer (skin and respiratory); may generate SO₂

No component is considered to be a carcinogen by the National Toxicology
Program, the International Agency for Research on Cancer, or the
Occupational Safety and Health Administration at OSHA thresholds for
carcinogens.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING

May cause moderate irritation to the skin. Skin sensitizer. Severe irritant to the eyes. Dusts or mists are irritating to mucous membranes. Repeated exposure may result in respiratory sensitization.

DOT hazard: Corrosive to steel
Emergency Response Guide #154
Odor: Mild; Appearance: Colorless To Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin. Skin sensitizer.

ACUTE EYE EFFECTS:

Severe irritant to the eyes.

ACUTE RESPIRATORY EFFECTS:

Dusts or mists are irritating to mucous membranes. Repeated exposure may result in respiratory sensitization.

INGESTION EFFECTS:

May cause gastrointestinal irritation. Very large doses may cause diarrhea, depression, colic and death. May also cause severe allergic reactions in sensitive individuals.

TARGET ORGANS:

Prolonged or repeated exposures may cause primary irritant dermatitis, skin sensitization, and/or allergic respiratory reactions.

MEDICAL CONDITIONS AGGRAVATED:

Asthma.

SYMPTOMS OF EXPOSURE:

Inhalation may cause eye, nose, throat and lung irritation and possible respiratory sensitization or asthma. Skin contact may cause moderate irritation to severe burns and sensitization.

4 FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 FIRE FIGHTING MEASURES**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

MISCELLANEOUS:

Corrosive to steel

UN2693;Emergency Response Guide #154

6 ACCIDENTAL RELEASE MEASURES**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 HANDLING & STORAGE**HANDLING:**

Vent carefully before opening. Sulfur dioxide can be formed during the normal use and handling of this product.

STORAGE:

Keep containers closed when not in use. Do not freeze. If frozen, thaw and mix completely prior to use.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION**EXPOSURE LIMITS****CHEMICAL NAME****SODIUM BISULFITE**

PEL (OSHA): 5 MG/M3

TLV (ACGIH): 5 MG/M3

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure

limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with acid gas cartridges and dust/mist prefilters.

SKIN PROTECTION:

gauntlet-type neoprene gloves, chemical resistant apron—

Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles, face shield

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav.(70F,21C) 1.360 Vapor Pressure (mmHG) ~18.0

Freeze Point (F) 27 Vapor Density (air=1) < 1.00

Freeze Point (C) -3

Viscosity(cps 70F,21C) 20 % Solubility (water) 100.0

Odor Mild

Appearance Colorless To Yellow

Physical State Liquid

Flash Point P-M(CC) > 200F > 93C

pH As Is (approx.) 3.8

Evaporation Rate (Ether=1) < 1.00

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

- Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT: 2,000 mg/kg

Dermal LD50 RABBIT: >2,000 mg/kg

NOTE - Estimated value

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Renewal Bioassay

No pH adjustments were made. Toxicity is a function of the pH of the test solutions.

LC50: 175 mg/L
No Effect Level: 125 mg/L

Daphnia magna 48 Hour Static Renewal Bioassay
No pH adjustments were made. Toxicity is a function of the pH
of the test solutions.

LC50: 175 mg/L
No Effect Level: 125 mg/L

BIODEGRADATION
No Data Available.

13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA
hazardous waste identification number is :
D002=Corrosive(steel).

Please be advised; however, that state and local requirements for
waste disposal may be more restrictive or otherwise different from
federal regulations. Consult state and local regulations regarding
the proper disposal of this material.

14 TRANSPORT INFORMATION

DOT HAZARD: Corrosive to steel
UN / NA NUMBER: UN2693
DOT EMERGENCY RESPONSE GUIDE #: 154

15 REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

1,104 gallons due to SODIUM BISULFITE;

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

**CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

No regulated constituent present at OSHA thresholds
MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	2	Moderate Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard

(1) Protective Equipment D Goggles, Face Shield, Gloves, Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status: 24-JUL-1997		** NEW **
11-AUG-1997 12		24-JUL-1997
19-NOV-1997 3,5,14,16		11-AUG-1997
18-OCT-1999 3,14		19-NOV-1997
26-APR-2001 4		18-OCT-1999



GE Betz

GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 05-NOV-2001

EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

SPECTRUS OX1201

PRODUCT APPLICATION AREA:

WATER-BASED MICROBIAL CONTROL AGENT.

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation. This product is subject to the Pennsylvania and New Jersey Worker and Community Right to Know Law.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
7647-15-6	SODIUM BROMIDE Irritant

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at Pennsylvania thresholds for carcinogens.

NON-HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
7732-18-5	WATER

3 HAZARDS IDENTIFICATION

***** EMERGENCY OVERVIEW

CAUTION

Non-hazardous to skin. May cause moderate irritation to the eyes.

Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable

Emergency Response Guide is not applicable

Odor: Slight; Appearance: Colorless, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; Non-hazardous to skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause gastrointestinal irritation.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

4 FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing.

Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

Probable mucosal damage may contraindicate the use of gastric lavage.

5 FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6 ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Contaminated area may be washed down with water.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Dispose of in approved pesticide facility or according to label instructions.

7 HANDLING & STORAGE

HANDLING:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Do not freeze. If frozen, thaw and mix completely prior to use.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

SODIUM BROMIDE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.403	Vapor Pressure (mmHG)	- 18.0
Freeze Point (F)	< -30	Vapor Density (air=1)	< 1.00
Freeze Point (C)	< -34		
Viscosity (cps 70F, 21C)	12	% Solubility (water)	100.0
Odor	Slight		
Appearance	Colorless		
Physical State	Liquid		
Flash Point	P-M(CC) > 200F > 93C		
pH As Is (approx.)	7.5		
Evaporation Rate (Ether=1)	< 1.00		

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

Solid sodium bromide may react with easily oxidizable materials.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>5,000 mg/kg
Reproductive Toxicity RAT:	4,800 mg/kg/day
NOTE - 3-Generation: decreased fertility	
Dermal LD50 RABBIT:	>2,000 mg/kg
Skin Irritation Score RABBIT:	0
Eye Irritation Score RABBIT:	16

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Bluegill Sunfish 96 Hour Static Acute Bioassay (As Bromine)

LC50= .52; No Effect Level= .3 mg/L

Daphnia magna 48 Hour Static Acute Bioassay (As Bromine)

LC50= .71; No Effect Level= .41 mg/L

Daphnia magna 48 Hour Static Acute Bioassay (Product as is)

LC50= 27500 mg/L

Mysid Shrimp 96 Hour Flow-Thru Bioassay (As Bromine)

LC50= .17 mg/L

Rainbow Trout 96 Hour Static Acute Bioassay (As Bromine)

LC50= .23 mg/L

Sheepshead Minnow 96 Hour Flow-Thru Bioassay (As Bromine)

LC50= .19; No Effect Level= .11 mg/L

BIODEGRADATION

Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in waste treatment or the environment.

13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

DOT HAZARD: Not Applicable
UN / NA NUMBER: Not applicable
DOT EMERGENCY RESPONSE GUIDE #: Not applicable

15 REGULATORY INFORMATION

TSCA:

This is an EPA registered biocide and is exempt from TSCA inventory requirements.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

FIFRA REGISTRATION NUMBER:

5185-451-3876

FOOD AND DRUG ADMINISTRATION:

The ingredients in this product are approved by FDA under 21 CFR 176.300.

USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS:

This product is composed of ingredients previously approved by USDA to meet G5 and G7 classification and may be used in water for cooking/cooling or in boiler or cooling systems with no food contact.

SARA SECTION 312 HAZARD CLASS:

Immediate(acute)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC

ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	1	Slight Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	A	Safety Glasses

Aluminum Sulfate, Dry

MSDS No. 010

Date of Preparation: 12/10/01

Revision: 2.0

Material Safety Data Sheet

Section 1 - Chemical Product and Company Identification

Product/Chemical Name:	Aluminum Sulfate, Dry	Manufacturer:	Delta Chemical Corporation,
Chemical Formula:	$Al_2(SO_4)_3 \cdot (14-18)(H_2O)$		2601 Cannery Avenue,
CAS Number:	10043-01-3		Baltimore, MD 21226-1595,
General Use:	Water Treatment Chemical		Phone 410-354-0100, (7:00am 5:00pm)
Emergency Contact:	800-424-9300		FAX 410-354-1021
	Chemtec		

HMIS
H 1
F 0
R 1
PPE†
†Sec. 8

Section 2 - Composition / Information on Ingredients

Ingredient Name	CAS Number	% wt
Aluminum Sulfate	10043-01-3	57
Water	7732-18-5	43

Ingredient	OSHA PEL		ACGIH TLV		NIOSH REL		NIOSH
	TWA	STEL	TWA	STEL	TWA	STEL	IDLH
Aluminum Sulfate	2 mg/m ³ as aluminum	none estab.	none estab.	none estab.	none estab.	none estab.	none estab.

Toxicity Data:

Section 3 - Physical and Chemical Properties

Physical State:	solid	Water Solubility:	Complete
Appearance and Odor:	White granule or powder	Boiling Point:	117° C/242° F
Odor Threshold:	negligible odor	Freezing/Melting Point:	105° C/221° F
Vapor Pressure:	None	% Volatile:	0.0
Vapor Density (Air=1):	Not applicable		
Density:	varies, <98 lb/cu ft		
pH of 1% solution:	3.3 ± 0.5		

Section 4 - Fire-Fighting Measures

Flash Point:	Not applicable	
Burning Rate:	Not applicable	
Autoignition Temperature:	Not applicable	
LEL:	Not applicable	
UEL:	Not applicable	
Flammability Classification:	Non-flammable	
Unusual Fire or Explosion	If exposed to temperatures greater than 1400°F aluminum sulfate will decompose generating toxic and corrosive gas.	
Hazards:		
Hazardous Combustion Products:	See Section V	
Fire-Fighting Instructions:	Do not release runoff from fire control methods to sewers or waterways.	

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Section 5 - Stability and Reactivity

Stability:	Aluminum Sulfate, Dry is stable at room temperature in closed containers under normal storage and handling conditions.
Polymerization:	Hazardous polymerization cannot occur.
Chemical Incompatibilities:	Contact with alkalis and water-reactive materials causes exothermic reactions.
Conditions to Avoid:	None
Hazardous Decomposition Products:	Thermal oxidative decomposition of Aluminum Sulfate occurs at temperatures greater than 1400°F and can produce sulfur oxides.

Section 6 - Health Hazard Information

Potential Health Effects

Primary Entry Routes:	Ingestion or inhalation
Target Organs:	None
Acute Effects	No unusual
Eye:	May cause a burning feeling.
Skin:	May cause a skin rash or burning feeling.
Ingestion:	May cause irritation of stomach and intestines. May cause nausea, vomiting or purging.
Inhalation:	Breathing aluminum sulfate can irritate the nose, throat and lungs causing coughing, wheezing and/or shortness of breath.
Carcinogenicity:	IARC, NTP, and OSHA do not list Aluminum Sulfate, Dry as a carcinogen.
Medical Conditions Aggravated by Long-Term Exposure:	Aluminum sulfate can irritate the lungs. Repeated exposure may cause bronchitis to develop with cough, phlegm, and/or shortness of breath.
Chronic Effects:	There is no evidence that aluminum sulfate causes cancer or affects reproduction.

Emergency and First Aid Procedures

Inhalation:	Remove from exposure, seek medical treatment if any symptoms occur.
Eye Contact:	Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention.
Skin Contact:	Remove contaminated clothing and wash contaminated skin with water.
Ingestion:	Do not induce vomiting, drink milk or water and immediately seek medical attention. Ingestion may irritate gastrointestinal tract.

After first aid, get appropriate in-plant, paramedic, or community medical support.

Section 7 - Section 7 - Spill, Leak, and Disposal Procedures

Spill /Leak Procedures:	Spill procedures are dictated by site wastewater flow controls and will vary from site to site. General procedures are provided in this document, but authorization for any wastewater discharge must be obtained prior to the discharge.
Large and Small Spills:	Sweep and shovel up dry chemical and place in a covered container. Wash down residue with large amounts of water and neutralize with soda ash or lime if necessary. Aluminum sulfate solutions can have a pH less than two. The neutralization of aluminum sulfate can generate carbon dioxide. Adequate ventilation must be provided.
Containment:	Do not discharge wastewaters to the environment or a wastewater treatment plant without authorization from the appropriate officials. Aluminum sulfate may absorb moisture and powders or crystals can solidify into a single mass. Protect aluminum sulfate from moisture.
Cleanup:	Wash impacted areas with water to remove residues.
Regulatory Requirements:	Follow applicable OSHA regulations (29 CFR 1910.120).

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Section 7 - Section 7 - Spill, Leak, and Disposal Procedures

Disposal: Contact your supplier or a licensed contractor for detailed recommendations. Follow applicable Federal, state, and local regulations.

Container Cleaning and Disposal: Make sure bags are completely empty and dispose of as industrial/commercial waste.

Ecological Information:**EPA Regulations:**

RCRA Hazardous Waste Number:	Not listed (40 CFR 261.33)
RCRA Hazardous Waste Classification	(40 CFR 261.): Not classified
CERCLA Hazardous Substance (40 CFR 302.4)	Listed CWA, Sec. 311 (b)(4)
CERCLA Reportable Quantity (RQ)	5,000 lbs (2,270 kg) as $Al_2(SO_4)_3$ 8,870 lbs (4,023 kg) as $Al_2(SO_4)_3 \cdot 14(H_2O)$

SARA 311/312 Codes:**SARA Toxic Chemical (40 CFR 372.65):****SARA EHS (Extremely Hazardous Substance) (40 CFR 355):**

Immediate (acute) health hazard

Not listed

Not listed

OSHA Regulations:**Air Contaminant (29 CFR 1910.1000, Table Z-1, Z-1-A):**

Not listed

OSHA Specifically Regulated Substance (29CFR 1910.)

Not listed

State Regulations:

Section 8 - Exposure Controls / Personal Protection

Engineering Controls: The best protection is to enclose operations and/or provide local exhaust ventilation at the site of the chemical release. Dust emission control may be required depending on the dust generation rate. Isolation operations can also reduce exposure.

Ventilation: Can be used to control dust exposure but may require emission controls.

Administrative Controls: Good work practices can help to reduce exposures. Train employees to minimize dust while handling this material.

Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, or storage tanks), wear an SCBA. *Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.* If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear protective gloves, boots, long pants and long sleeve shirts to prevent prolonged or repeated skin contact. Wear protective chemical safety glasses, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.

Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.

Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.

Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

69017409-4**Section 9 - Special Precautions and Comments**

Handling Precautions: Minimize and/or control dust while handling.

Storage Requirements: Store in a cool, dry place. Wet aluminum sulfate will corrode steel.

Disclaimer: The information presented herein is believed to be accurate and reliable, but is given without guaranty or warranty, expressed or implied. The user should not assume that all safety measures are indicated or that other measures may not be required. The user is responsible for assuring that the product and equipment are used in a safe manner that complies with all appropriate legal standards and regulations.

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**EFFECTIVE DATE: 04-APR-1997
PRINTED DATE: 25-JUL-1997

UPDATE

EV-2-92
u**1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME : POLYMER 1181

PRODUCT APPLICATION AREA: COAGULANT.

COMPANY ADDRESS:BetzDearborn Inc., Water Management Group
200 Witmer Road, Horsham, PA 19044
Information phone number (215) - 773-6131

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation. This product is subject to the Pennsylvania and New Jersey Worker and Community Right to Know Law.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
50-00-0	FORMALDEHYDE Toxic (by skin absorption and inhalation); irritant (eyes, skin, and respiratory); sensitizer (skin and respiratory); probable human carcinogen (IARC-2A; NTP-anticipated)
9003-08-1	1,3,5-TRIAZINE-2,4,6-TRIAMINE, POLYMER WITH METHANAL Irritant (eyes and skin)
7647-01-0	HYDROCHLORIC ACID Corrosive

PRODUCT NAME : POLYMER 1181
EFFECTIVE DATE: 04-APR-1997

NON-HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
7732-18-5	WATER

HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause slight irritation to the eyes. Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract. Respiratory sensitization may occur.

DOT hazard: Not Applicable
Emergency Response Guide #60
Odor: Acrid; Appearance: Opalescent, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause slight irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Primary route of exposure; Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract. Respiratory sensitization may occur.

INGESTION EFFECTS:

May cause slight gastrointestinal irritation with possible nausea, vomiting, abdominal discomfort and diarrhea.

TARGET ORGANS:

Prolonged or repeated exposures may cause skin sensitization and/or allergic respiratory reactions. Product or product component is an OSHA suspect carcinogen.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause local irritation or a sensitization reaction upon direct contact with skin or respiratory tract. Inhalation of vapors, mists, and/or aerosols may cause headache and nausea.

FIRST AID MEASURES

SKIN CONTACT:

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F SETA(CC)

MISCELLANEOUS:

Not Applicable
UN1760;Emergency Response Guide #60

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Acidic. Do not mix with alkaline material.

STORAGE:

Keep containers closed when not in use. Protect from freezing.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

CHEMICAL NAME EXPOSURE LIMITS

FORMALDEHYDE

PEL (OSHA): 0.75 PPM(STEL-2PPM)
TLV (ACGIH): 0.3 PPM-CEILING

1,3,5-TRIAZINE-2,4,6-TRIAMINE,POLYMER WITH METHANAL

PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

HYDROCHLORIC ACID

PEL (OSHA): 5 PPM
TLV (ACGIH): 5 PPM(CEILING)

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with formaldehyde cartridges and dust/mist prefilters.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F)	1.033	Vapor Pressure (mmHG)	18.0
Freeze Point (F)	32.00	Vapor Density (air-1)	< 1.00
Viscosity (cps 70F)	16	% Solubility (water)	100.0

Odor	Acrid
Appearance	Opalescent
Physical State	Liquid
Flash Point (F)	> 200 SETA(CC)
pH As Is (approx.)	1.6
Evaporation Rate (Ether-1)	< 1.00

NA = not applicable ND = not determined

STABILITY AND REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZ INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>10,000 mg/kg
Dermal LD50 RABBIT:	>1,250 mg/kg
Inhalation LC50 RAT:	>15,000 ppm/4hr
Skin Irritation Score RABBIT:	Minimal
Eye Irritation Score RABBIT:	Minimal

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Screen with 48-Hour Renewal

The adsorptive characteristics of the material to the test organism resulted in increased stress and mortality. Mortality was observed in lowest concentration tested. pH of test solutions was adjusted to a level of 6-9.

35% Mortality: 5000 mg/L

25% Mortality: 10 mg/L

Daphnia magna 48 Hour Static Renewal Bioassay

pH of test solutions was adjusted to a level of 6-9.

LC50: 2020 mg/L

No Effect Level: 893 mg/L

Bluegill Sunfish 96 Hour Static Acute Bioassay

LC50: 44 mg/L

No Effect Level: 32 mg/L

BIODEGRADATION

COD (mg/gm): 30

TOC (mg/gm): 30

BOD-5 (mg/gm): 1

BOD-28 (mg/gm): 38

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002 = Corrosive(pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD: Not Applicable
UN / NA NUMBER: UN1760
DOT EMERGENCY RESPONSE GUIDE #: 60

15) REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

2,325 gallons due to FORMALDEHYDE;

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

CAS#	CHEMICAL NAME
50-00-0	FORMALDEHYDE

SARA SECTION 313 CHEMICALS:

CAS#	CHEMICAL NAME	RANGE
50-00-0	FORMALDEHYDE	0.1-1.0%
7647-01-0	HYDROCHLORIC ACID	0.1-1.0%

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

This product contains these chemicals known to the state of California to cause cancer or reproductive toxicity:

CAS#	CHEMICAL NAME
50-00-0	FORMALDEHYDE

MICHIGAN REGULATORY INFORMATION

CAS#	CHEMICAL NAME
50-00-0	FORMALDEHYDE

PRODUCT NAME : POLYMER 1181
EFFECTIVE DATE: 04-APR-1997

OTHER INFORMATION

NFPA/HMIS

Health 1
Fire 1
Reactivity 0
Special ACID
(1) Protective Equipment B

CODE TRANSLATION

Slight Hazard
Slight Hazard
Minimal Hazard
pH below 2.1
Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	22-AUG-1995	REVISED FORMAT	** NEW **
	24-MAY-1996	12;EDIT:8	22-AUG-1995
	17-JAN-1997	12	24-MAY-1996
	04-APR-1997	15	17-JAN-1997

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

EFFECTIVE DATE: 24-AUG-2000

PRINTED DATE: 24-AUG-2000

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**PRODUCT NAME : POLYFLOC AP1100****PRODUCT APPLICATION AREA: FLOCCULANT.****COMPANY ADDRESS:**

BetzDearborn Inc.

4636 Somerton Road, Trevose, Pa. 19053

Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)**2) COMPOSITION / INFORMATION ON INGREDIENTS**

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

This product is not hazardous as defined by OSHA regulations.

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3) HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Dusts may cause irritation to the upper respiratory tract.

DOT hazard is not applicable
Emergency Response Guide is not applicable
Odor: None; Appearance: White, Powder

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical/CO2/foam or water--Slippery condition; use sand/grit.

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Dusts may cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

May cause slight gastrointestinal irritation with possible nausea, vomiting, abdominal discomfort and diarrhea.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

4) FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical/CO2/foam or water--Slippery condition; use sand/grit.

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Reasonable and safe chemical storage. Keep dry.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

This product is not hazardous as defined by OSHA regulations.

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

airtight chemical goggles

9) PHYSICAL AND CHEMICAL PROPERTIES

Density	42.000 lb/cu.	Vapor Pressure (mmHG)	< 1.0
Freeze Point (F)	NA	Vapor Density (air=1)	< 1.00
Freeze Point (C)	NA		
Viscosity(cps 70F,21C)	NA	% Solubility (water)	1.0
Odor	None		
Appearance	White		
Physical State	Powder		
Flash Point	P-M(CC)	> 200F > 93C	
pH 5% Sol. (approx.)		7.0	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

EFFECTIVE DATE: 24-AUG-2000

10) STABILITY AND REACTIVITY**STABILITY:**

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"A"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:

>5,000 mg/kg

28 Day Oral RAT/DOG:

NEGATIVE

NOTE - Rat two-year feed: no adverse effects. Dog one-year feed:
no adverse effects.

Dermal LD50 RABBIT:

>2,000 mg/kg

NOTE - Non-toxic at high dose levels

Skin Irritation Score RABBIT:

NEGATIVE

Eye Irritation Score RABBIT:

SLIGHT

Skin Sensitization G.PIG:

NEGATIVE

12) ECOLOGICAL INFORMATION

QUATIC TOXICOLOGY

Rainbow Trout 72 Hour Static Screen

0% Mortality: 100 mg/L

Daphnia magna 48 Hour Static Screen

No mortality was observed in highest concentration tested.

0% Mortality: 500 mg/L

Bluegill Sunfish 96 Hour Static Screen

0% Mortality: 300 mg/L

Fathead Minnow 96 Hour Static Screen

No mortality was observed in highest concentration tested.

0% Mortality: 500 mg/L

Ceriodaphnia 48 Hour Static Acute Bioassay

LC50: 5 mg/L

No Effect Level: 1.6 mg/L

BIODEGRADATION

COD (mg/gm): 2970
TOC (mg/gm): 680
BOD-5 (mg/gm): 1
BOD-28 (mg/gm): 22

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD: Not Applicable
UN / NA NUMBER: Not applicable
DOT EMERGENCY RESPONSE GUIDE #: Not applicable

PRODUCT NAME : POLYFLOC AP1100
EFFECTIVE DATE: 24-AUG-2000

15) REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

FOOD AND DRUG ADMINISTRATION:

21 CFR 176.110 (acrylamide - acrylic acid resins)

All ingredients comprising this product are authorized by FDA for the manufacture of paper and paperboard that may contact aqueous and fatty foods as per 21 CFR 176.170(a) (4).

USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS:

SEC.G6,L1

SARA SECTION 312 HAZARD CLASS:

Product is non-hazardous under Section 311/312

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

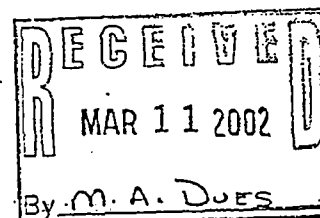
Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	28-JAN-1997		** NEW **
	01-JUL-1997	15	28-JAN-1997
	27-MAY-1999	15	01-JUL-1997
	24-AUG-2000	4	27-MAY-1999

PRODUCT NAME: LIQUICHLOR / SODIUM HYPOCHLORITE 7-15%
SDS NUMBER: OX622680
EFFECTIVE DATE: 1/10/1999
SUPERSEDES: NEW
ISSUED BY: 008740



THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THIS PRODUCT MAY BE CONSIDERED TO BE A HAZARDOUS CHEMICAL UNDER THAT STANDARD. REFER TO THE OSHA CLASSIFICATION IN SEC.I.) THIS INFORMATION IS REQUIRED TO BE DISCLOSED FOR SAFETY IN THE WORKPLACE. THE EXPOSURE TO THE COMMUNITY, IF ANY, IS QUITE DIFFERENT.

-PRODUCT IDENTIFICATION

Product Name: Sodium Hypochlorite
Synonyms: Liquid chlorine solution, Liquid bleach, Hypochlorite, bleach, Hypo
Chemical Family: Hypochlorite
Formula: NaOCl in water
Use Description: Swimming pool chlorinator, Microbiocide, textile/laundry bleaching agent, hard surface cleaner, mildewicide, water treatment
Hazard Classification: Oxidizer, unstable (reactive), corrosive, lung toxin

I -COMPONENT DATA

Product Composition

AS or Chemical Name: Sodium hypochlorite
AS Number: 7681-52-9
Concentration Range: 7-15
Hazardous Per 29 CFR 1910.1200: Yes
Exposure Standards: None Established for Sodium Hypochlorite, see Hazardous Decomposition, Section VII.
AS or Chemical Name: Water
AS Number: 7732-18-5
Concentration Range: 70.5-87.5
Hazardous Per 29 CFR 1910.1200: No
Exposure Standards: None Established.

AS or Chemical Name: Sodium hydroxide
AS Number: 1310-73-2
Concentration Range: 0.5 - 2.5
Hazardous Per 29 CFR 1910.1200: Yes
Exposure Standards:

	OSHA (PEL) *	ACGIH (TLV)
WA:	ppm	ppm
	mg/m 3	mg/m 3
EXPOSURE:	N/A	N/A
	2	None
PEL:	N/A	N/A
	None	2
	N/A	None

Federal OSHA PEL. An Agreement
state OSHA PEL may be different.

AS or Chemical Name: Sodium chloride
AS Number: 7647-14-5
Concentration Range: 5.0 - 12.0
Hazardous Per 29 CFR 1910.1200: Yes
Exposure Standards: None Established

II PRECAUTIONS FOR SAFE HANDLING AND STORAGE

WASH OR RINSE, WASH OFF WITH WATER. . . AVOID BREATHING MIST OR VAPOR.

STORAGE CONDITIONS:

Store in a cool, dry, well-ventilated area. Avoid high temperatures and exposure to and direct sunlight.

DO NOT STORE AT TEMPERATURES ABOVE: 15-21 Deg. C (60-70 Deg. F)

OTHER: Store in the dark at the lowest possible temperature, but keep from freezing.

PERCENT STABILITY AND COMPATIBILITY:

SHELF LIFE LIMITATIONS: Up to 6 months at 60 Deg. F. or lower

INCOMPATIBLE MATERIALS FOR PACKAGING: Metal containers.

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT:

Oxidizers, acids, nitrogen containing materials such as quaternary ammonium salts, metals such as copper, nickel or cobalt..

69017288-2

IV -PHYSICAL DATA

Appearance: Greenish-yellow liquid

Freezing Point: -20 °C @ 7% NaOCl

Boiling Point: Decomposes on heating

Decomposition Temperature: Decomposition rate increases as heated

Specific Gravity: 1.08 - 1.26

Bulk Density: Not Applicable

pH @22°C: 12-14

Vapor Pressure @ 22°C: No Data

Solubility in Water: Miscible

Volatiles, Percent by Volume: 87.5-94.5

Evaporation Rate: No Data

Vapor Density: No Data

Molecular Weight: 74.5 (active ingredient-NaOCl)

Odor: Chlorine-like

Coefficient of Oil/Water Distribution: No Data

V -PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Personal Protection for Routine Use of Product:

Respiratory Protection: Routine: If vapors, mists, or aerosols are not controlled with ventilation to below the TLV wear a NIOSH approved respirator.

Line breaking/hose connections/samples, etc.: Wear a NIOSH approved workplace respirator as air concentrations above the TLV for chlorine may occur unexpectedly.

Ventilation: Routine: Local exhaust ventilation is recommended if vapors, mists or aerosols are generated. Otherwise, use general exhaust ventilation.

Line breaking/hose connections/samples, etc.: Use local exhaust ventilation

Skin and Eye Protection: Routine: Use chemical safety goggles and impermeable gloves.

Line breaking/hose connections/samples, etc.: Wear chemical safety goggles and face shield, impermeable gloves, boots and protective suit.

Other: Emergency eye wash and safety showers must be provided in the immediate work area..

Equipment Specifications (When Applicable):

Respirator Type: NIOSH approved respirator equipped with chemical cartridges for protection against chlorine gas and dust mist pre-filters.

Protective Clothing Type: (This includes: gloves, boots, apron, protective suit.): Neoprene

VI -FIRE AND EXPLOSION HAZARD INFORMATION

Flammability Data:

Combustible: No
Chlorophoric: No
Flash Point: Not Applicable
Autoignition Temperature: Not Applicable
Flammable Limits at Normal Atmospheric Temperature and Pressure
Percent Volume in Air):
EL - Not Applicable
E₁ - Not Applicable

FPA Ratings:
Health: Not Established
Flammability: Not Established
Reactivity: Not Established

MIS Ratings:
Health: 3
Flammability: 0
Reactivity: 2

Extinguishing Media: Not applicable
Fire Fighting Techniques and Comments:
Use water to cool containers exposed to fire. On small fire, use dry chemical, carbon dioxide or water spray. On large fires, use water in flooding quantities as fog. In case of fire, hazardous concentrations of chlorine may be formed. See Section XI for personal protective equipment for fire fighting.

III - REACTIVITY INFORMATION

Conditions Under Which This Product May Be Unstable:
Temperatures Above: Decomposition rate increases as it is heated
Mechanical Shock or Impact: No
Electrical (Static) Discharge: No
Other: Decomposition will result formation of oxygen from
Contact with copper, nickel, cobalt and iron
Hazardous Polymerization: Will not occur
Incompatible Materials: Iron, copper, nickel, cobalt, acids, ammonium or
Other nitrogen containing compounds, organics,
Other oxidizers
Hazardous Decomposition: Chlorine gas
Other conditions to avoid: High heat, sunlight and ultra-violet light

Summary of Reactivity:
Explosive: N/A
Oxidizer: Yes
Chlorophoric: No
Organic Peroxide: No
Water Reactive: No
Corrosive: N/A

III - FIRST AID

yes
Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention at once.
Skin
Immediately flush with water for at least 15 minutes. Seek medical attention. If clothing, shoes and/or jewelry come in contact with the product, they removed immediately and laundered before re-use.
Ingestion
Immediately drink large quantities of water. DO NOT induce vomiting. Seek medical attention at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.

person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Seek medical attention. In the event that an individual inhales enough vapor to lose consciousness, person should be moved to fresh air at once and seek medical attention immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases, ensure adequate ventilation and provide respiratory protection before the person returns to work.

IX -TOXICOLOGY AND HEALTH INFORMATION

Routes of Absorption

Inhalation, skin, eye, ingestion

Warning Statements and Warning Properties

CAUSES RESPIRATORY TRACT IRRITATION. . CAUSES EYE AND SKIN BURNS. CAN CAUSE LUNG DAMAGE.

Human Threshold Response Data

Odor Threshold: Approximately 0.9 mg/M³ (0.3 ppm) based on odor of chlorine.

Irritation Threshold: No data for Sodium hypochlorite.

However, decomposition products may be irritating.

Immediately Dangerous to Life or Health: No Data. However, Sodium hypochlorite has the potential to be immediately dangerous to life or health.

Signs, Symptoms and Effects of Exposure

Inhalation

Acute: Inhalation of this material is irritating to the nose, mouth, throat and lungs. It may also cause burns to the respiratory tract with the production of lung edema, which can result in shortness of breath, wheezing, choking, chest pain, and impairment of lung function. Inhalation of high concentrations can result in permanent lung damage.

Chronic: Repeated inhalation exposure may cause impairment of lung function and permanent lung damage.

Skin

Acute: Dermal exposure can cause severe irritation and/or burns characterized by redness, swelling and scab formation. Prolonged skin exposure may cause destruction of the dermis with impairment of the skin at site of contact to regenerate.

Chronic: Effects from chronic skin exposure would be similar to those from single exposure except for effects secondary to tissue destruction.

Eye

Severe irritation and/or burns can occur following eye exposure. Contact may cause impairment of vision and corneal damage..

Ingestion

Acute: Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding, and/or tissue ulceration.

Chronic: There are no known or reported effects from chronic exposure.

Medical Conditions Aggravated by Exposure

Asthma and respiratory and cardiovascular disease

Interactions With Other Chemicals Which Enhance Toxicity

None known or reported

Animal Toxicology

Acute Target Organ Toxicity

NEUTRALIZATION LC50: No available data

ORAL LD50: Approximately 3-5 g/kg (rat)

Chronic Target Organ Toxicity

here are no known or reported effects from repeated exposure.

Reproductive and Developmental Toxicity

here are no known or reported effects on reproductive function or fetal development.

Carcinogenicity

Sodium hypochlorite has been shown not to be carcinogenic in laboratory animals.

It is not included as a carcinogen by IARC, OSHA, NTP, or EPA. IARC has concluded that there is inadequate evidence for the carcinogenicity of hypochlorite salts in laboratory animals and there is no data available from studies in humans.

Therefore, IARC considers hypochlorite salts to be not classifiable as to their carcinogenicity to humans.

Mutagenicity

Sodium hypochlorite has been shown to produce damage to genetic material when tested in vitro. Studies in vivo have shown no evidence of mutagenic potential for this material. Chemicals with potent biocidal activity, typical of hypochlorite compounds, may compromise the integrity of many of the treated cells, which remain viable during an in vitro assay. This result could likely produce cellular changes giving rise to a response indicative of mutation. It is judged that the risk of genetic damage is insignificant for sodium hypochlorite because of its biocidal activity, lack of mutagenicity in vivo, and failure to produce a carcinogenic response.

Aquatic Toxicity

Aquatic LC50 - approximately 0.6 mg/l (bluegill)

approximately 1 mg/l (daphnia, 48 hours)

TRANSPORTATION INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT Description from the Hazardous Materials Table 49 CFR 172.101:

and (U.S. DOT): HYPOCHLORITE SOLUTIONS, 8, UN1791, PG II

Water (IMO): Same as above

Air (IATA/ICAO): Same as above

Label/Placard: CORROSIVE

Reportable Quantity: 100 lbs. (Per 49 CFR 172.101, Appendix)

Emergency Guide: 154

SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300

Reportable Quantity: 100 LBS. (Per 40 CFR 302.4)

Spill Mitigation Procedures:

Hazardous concentrations in air may be found in local spill area and immediately downwind.

Air Release: Vapors may be suppressed by the use of a water fog. Capture all run-off water for treatment and disposal.

Water Release: This material is soluble in water. Dike or contain material via use of compatible absorbents. Remove material with use of vacuum or pump operation and treat before disposition. This material is harmful to aquatic life.

and Spill: Compatible absorbents: Sand, clay soil, commercial absorbents.

Spill Residues:

Dispose of per guidelines under Section XII, WASTE DISPOSAL.

This material may be neutralized for disposal; you are requested to contact CEAN

at 888-2891-911 before beginning any such operation.

Personal Protection for Emergency Spill and Firefighting Situations:

Response to this material requires the use of self-contained breathing apparatus (SCBA).

Additional protective clothing must be worn to prevent personal contact with this material. These items include but are not limited to boots, gloves, hard hat, impervious clothing, i.e. chemically impermeable suit.

II -WASTE DISPOSAL

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D002.

If hazardous liquid waste, it must be disposed of in accordance with local, state and federal regulations in a permitted hazardous waste treatment, storage and disposal facility by treatment.

PRECAUTIONS MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF USED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

III - ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT: This substance is listed on the Toxic Substances Control Act inventory.

MSF LIMITS: NSF Maximum Drinking Water Usage Concentration - 250 mg/l as sodium hypochlorite

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE III: None Established
HAZARD CATEGORIES, PER 40 CFR 370.2:

HEALTH: Immediate (Acute)

Delayed (Chronic)

PHYSICAL:

Flame

Reactivity

EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW, PER 40 CFR 355, APP.A:

EXTREMELY HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:

None Established

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372-45: None Established.

----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR

VOPAK USA INC.

DURING BUSINESS HOURS, PACIFIC TIME

(425)889-3400

----- NOTICE -----

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ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A

PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN,

AND SHALL UNDER NO CIRCUMSTANCES BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

DO NOT USE INGREDIENT INFORMATION AND/OR INGREDIENT PERCENTAGES IN THIS MSDS AS A PRODUCT SPECIFICATION. FOR PRODUCT SPECIFICATION INFORMATION REFER TO A PRODUCT SPECIFICATION SHEET AND/OR A CERTIFICATE OF ANALYSIS. THESE CAN BE OBTAINED FROM YOUR LOCAL VOPAK USA SALES OFFICE.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, VOPAK MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND VOPAKS CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM

1986]

01/17/02 06:00 Vopak USA In 8of8

THE PUBLICATION OR USE OF, OR RELIANCE UPON , INFORMATION CONTAINED HEREIN.
THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT
RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER
PROCESS.

*** END OF MSDS ***

69017288-7

PRODUCTS & CHEMICALS
906 Adams Street
Steubenville, Ohio 43952
Phone: 614 - 282-1171

SANURIL® 115
(Mixed Halogen Formulation)
Material Safety Data Sheet

1. GENERAL PRODUCT INFORMATION

PRODUCT NAME SANURIL® 115
SYNONYMS • Calcium hypochlorite and 1-bromo-3-chloro-5,5-dimethylhydantoin
PRODUCT USE Disinfecting agent for wastewater
NIOSH* RATINGS
3 HIGH HEALTH HAZARD
0 NONCOMBUSTIBLE
2 MODERATELY REACTIVE

Ratings based upon Identification System for Occupationally Hazardous Materials (1974)

DEPARTMENT OF TRANSPORTATION INFORMATION

Proper Shipping Name Calcium Hypochlorite Mixture, Dry RQ
Hazard Class Oxidizer
UN Number UN1748

MANUFACTURER INFORMATION:

Company Name EES Corporation, A Subsidiary of ELTECH Systems Corporation
Street Address 12850 Bournemouth Drive
City, State, Zip Sugar Land, Texas 77478
Emergency Phone 1-800-424-9300
Office Phone (713) 274-8444 or Toll Free 1-800-621-9189
Date Revised 4/18/90

2. HAZARDOUS INGREDIENTS

Chemical Name	% of Mixture	TLV	PEL	CAS#
Calcium Hypochlorite	69.30%	N/A	N/A	7778-54-3
1-bromo-3-chloro-5,5-dimethylhydantoin	0.94%	10	15	5785-65-AA

TLV/PEL OF MIXTURE (If known) N/A

3. PHYSICAL PROPERTIES

BOILING POINT None; dry solid
MELTING POINT N/A
SPECIFIC GRAVITY 1.8 min (tablet)
VAPOR DENSITY N/A
VAPOR PRESSURE N/A
PERCENT VOLATILES N/A
SOLUBILITY IN WATER 6% by weight (min)
pH 8.3 (1% solution)
DENSITY (@ 20°C) 1.0
COLOR White solid tablet
ODOR Slight chlorine. N-bromo compounds have a stench-like odor. It is not as "sweet" as chlorine.

4. FIRE AND EXPLOSION DATA

FLASHPOINT N/A
AUTO IGNITE TEMP N/A
FLAMMABILITY LIMITS IN AIR N/A
EXPLOSIVE LIMIT LOWER: N/A
UPPER: N/A
EXTINGUISHING MEDIA Water ONLY

SPECIAL FIRE FIGHTING PROCEDURES:

This product is a strong oxidizer. Use ONLY water in the event of a fire or a violent reaction may result by contamination. Wear self-contained breathing apparatus.

042690/dd

4. FIRE AND EXPLOSION DATA (Continued)

UNUSUAL FIRE/EXPLOSION HAZARD:

Contamination with organics, acids, alkalies, and strong reducing agents will result in fire or rapid decomposition. Spontaneous decomposition temperature for this product is 350°F. In large fires fueled by other materials the product may smolder for prolonged periods emitting dense black smoke.

5. HEALTH HAZARD INFORMATION

THIS SECTION DESCRIBES THE NATURE OF THE HAZARDOUS EFFECT RESULTING FROM EXPOSURE TO THIS PRODUCT.

ROUTES OF EXPOSURE:

INGESTION:

Highly toxic by ingestion. May cause severe inflammation and erosion to the lining of the esophagus and stomach. Promptly induces vomiting.

EYE CONTACT:

Mild to moderate exposure to dust causes irritation of the eyes. Severe exposure can cause permanent (irreversible) damage.

SKIN CONTACT:

Mild to moderate exposure to dust may irritate the skin. Greater exposure can cause severe irritation.

INHALATION:

Mild to moderate exposure to dust causes irritation to the mucous membranes of the respiratory passages (nasal and throat).

SENSITIZING AGENT? NO

ABSORBED THROUGH THE SKIN? NO

SYSTEMIC POISON? NO

EFFECTS OF OVEREXPOSURE:

ACUTE:

Ingestion may result in erosion of the esophagus and stomach. Vomiting, gastric bleeding and possible circulatory collapse. Exposure may cause temporary or permanent tissue damage to skin, eyes, and respiratory passages.

CHRONIC:

Prolonged and intensive exposure may result in tissue damage to body surfaces unless promptly treated.

EMERGENCY AND FIRST AID PROCEDURES:

Eyes: IMMEDIATELY flush eyes with large amounts of water for at least 15 minutes, holding lids apart to ensure flushing of entire eye surface.
SEEK MEDICAL ATTENTION!

Skin: Wash with plenty of soap and water. Remove contaminated clothing and footwear. Wash clothing before reuse. Footwear should be decontaminated before reuse. Seek medical attention if symptoms persist.

Inhalation: Get person out of contaminated area to fresh air. If breathing has stopped, resuscitate and administer oxygen if readily available.
SEEK MEDICAL ATTENTION!

Ingestion: NEVER give anything by mouth to an unconscious person. Feed bread soaked in milk, followed by olive or cooking oil. DO NOT induce vomiting. Call a physician immediately!

6. REACTIVITY DATA

Conditions contributing to instability:

Contamination with flammables, organics may cause fire or explosion. Acids will release chlorine and bromine gas.

Incompatibility (Materials to avoid):

Acids, flammables, organic materials, readily oxidizable materials and strong reducing agents.

Hazardous decomposition or byproducts:

Chlorine gas, hydrogen bromide, bromine and hydrogen chloride.

Hazardous polymerization:

This product is not known to polymerize.

7. SPILL OR LEAK PROCEDURES (DEVELOP SPILL PLAN)

Neutralizing Chemicals:

Sodium sulfite, sodium bisulfite or sodium metabisulfite.

Steps to be Taken If Material is Released and/or Spilled:

Wear appropriate protective gear: rubber gloves and boots. Chemical splash goggles and breathing apparatus if necessary. Avoid contact with clothing--fire may result.

Dilute spill area with large quantities of water, at least 100 gallons of water per pound of material. Avoid contact with resulting solution. Neutralize with sodium sulfite, sodium bisulfite or sodium metabisulfite. Collected neutralized solution should be disposed of through sewage treatment plant. Prior approval from plant personnel as well as Local, State and Federal environmental agencies should be obtained. File environmental spill notifications if necessary.

Waste Disposal Methods:

DO NOT dispose of material in dry form in waste container--fire may result. Proceed with spill procedure as outlined above.

Additional Precautions:

Do not attempt to recover solid material. Do not dispose of material in waste container. Do not reuse empty container but place in trash collection.

8. INDUSTRIAL HYGIENE CONTROL MEASURES

Ventilation Requirements:

Work in well ventilated areas. Storage area should be well ventilated.

Specific Personal Protective Equipment:

Respiratory protection is not required under normal use, however when necessary, use NIOSH/MSHA approved respirator following manufacturer's recommendations. NIOSH approved dust mask is essential where dusting may occur.

Eye Protection: Chemical safety glasses should be worn.

Protective Gloves: Gloves should be worn. Rubber or other chemically resistant materials are recommended as suitable material.

Other Clothing and Equipment:

Protective clothing should be worn so as to minimize skin contact. Avoid contact with clothing. Fire may result from contact of dry material with cloth or flammables.

9. SPECIAL PRECAUTIONS

DANGER: highly corrosive. Causes skin and eye damage. May be fatal if swallowed. DO NOT get in eyes or on clothing. Wear goggles and CLEAN protective gloves when handling. Irritating to nose and throat. DO NOT breathe dust and fumes. Wash thoroughly with soap and water after handling. Remove and wash contaminated clothing before reuse.

This product is toxic to fish. Do not discharge into lakes, streams, ponds or public waters unless in accordance with an NPDES permit.

Strong oxidizing agent. Mix this product only with water. Use clean dry utensils. Open container only where adequate ventilation is available. Do not add this product to any dispensing device containing remains of any other product. In case of contamination/decomposition, do not reseal container. If possible, isolate container in open air and flood with large volumes of water.

10. STORAGE AND DISPOSAL

STORAGE:

Keep product dry and in a tightly closed container when not in use. Store in cool, dry, well ventilated area, keeping it away from heat sources and/or open flames. Handle container with care--DO NOT drop, roll or skid. In case of decomposition, isolate container (if possible) and flood with large amounts of water to dissolve all material. Follow "Spill and Leak Procedures" as outlined in Section 7 of this Data Sheet.

Keep in original container. DO NOT store/transfer/repack this product in any other container without the approval/authorization of EES Corporation.

DISPOSAL:

Follow "Spill and Leak Procedures" as outlined in Section 7 of this Data Sheet. DO NOT reuse empty container. Wash thoroughly with water and discard clean container in a safe place.

DO NOT CONTAMINATE FOOD OR FEED BY STORAGE, DISPOSAL OR CLEANING OF EQUIPMENT.

All information on this form is furnished solely for the purpose of compliance with OSHA's Hazard Communication Standard, 29CFR 1910.1200 and shall not be used for any other purpose.

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

69014777-1

EFFECTIVE DATE: 02-JUN-2000
PRINTED DATE: 02-JUN-2000

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : CORRSHIELD MD4103

**PRODUCT APPLICATION AREA: WATER-BASED CORROSION
INHIBITOR/DEPOSIT CONTROL AGENT.**

COMPANY ADDRESS:
BetzDearborn Inc.
4636 Somerton Road, Trevose, Pa. 19053
Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the
U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to
additional sections of this MSDS for our assessment of the potential
hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
7631-95-0	SODIUM MOLYBDATE (MOLYBDIC ACID, DISODIUM SALT) Potential irritant (respiratory)
1310-73-2	SODIUM HYDROXIDE (CAUSTIC SODA) Corrosive; toxic (by ingestion)
29385-43-1	1-H-BENZOTRIAZOLE, METHYL- (TOLYLTRIAZOLE; TTA) Solid is an irritant (by all routes); liquid is corrosive

No component is considered to be a carcinogen by the National Toxicology
Program, the International Agency for Research on Cancer, or the
Occupational Safety and Health Administration at OSHA thresholds for
carcinogens.

3) HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable
Emergency Response Guide is not applicable
Odor: Slight; Appearance: Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause slight gastrointestinal irritation.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

4) FIRST AID MEASURES

SKIN CONTACT:

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Alkaline. Do not mix with acidic material.

STORAGE:

Keep containers closed when not in use. Do not freeze. If frozen, thaw and mix completely prior to use.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

SODIUM MOLYBDATE (MOLYBDIC ACID,DISODIUM SALT)

PEL (OSHA): 5 MG/M3(AS Mo)

TLV (ACGIH): 5 MG/M3(AS Mo)

SODIUM HYDROXIDE (CAUSTIC SODA)

PEL (OSHA): 2 MG/M3

TLV (ACGIH): 2 MG/M3(CEILING)

1-H-BENZOTRIAZOLE,METHYL- (TOLYLTRIAZOLE; TTA)

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav.(70F,21C)	1.290	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	18	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-8		
Viscosity(cps 70F,21C)	12	% Solubility (water)	100.0
Odor	Slight		
Appearance	Yellow		
Physical State	Liquid		
Flash Point	P-M(CC)	> 200F > 93C	
pH As Is. (approx.)	13.4		
Evaporation Rate (Ether=1)	< 1.00		

NA = not applicable ND = not determined

10) STABILITY AND REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>4,000 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Acute Bioassay
pH of test solutions was adjusted to a level of 6-9.

LC50: 3320 mg/L

No Effect Level: 2110 mg/L

Daphnia magna 48 Hour Static Acute Bioassay
pH of test solutions was adjusted to a level of 6-9. No
mortality was observed in highest concentration tested.

0% Mortality: 5000 mg/L

Rainbow Trout 96 Hour Static Renewal Bioassay
pH of test solutions was adjusted to a level of 6-9.

LC50: 1710 mg/L

No Effect Level: 625 mg/L

BIODEGRADATION

COD (mg/gm):	31 Calculated
TOC (mg/gm):	11 Calculated
BOD-5 (mg/gm):	0 Calculated
BOD-28 (mg/gm):	2 Calculated

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002 = Corrosive(pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD:	Not Applicable
UN / NA NUMBER:	Not applicable
DOT EMERGENCY RESPONSE GUIDE #:	Not applicable

15) REGULATORY INFORMATION**TSCA:**

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

7,759 gallons due to SODIUM HYDROXIDE (CAUSTIC SODA);

USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS:

SEC.G5,G7

SARA SECTION 312 HAZARD CLASS:

Immediate(acute)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION**CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

69014777-7

16) OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	ALK	pH above 12.0
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

MSDS status:	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
	29-JAN-1997		** NEW **
	12-MAY-1997	15	29-JAN-1997
	12-NOV-1998	15	12-MAY-1997
	13-JAN-2000	12	12-NOV-1998
	02-JUN-2000	12	13-JAN-2000

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

EFFECTIVE DATE: 19-APR-2001

PRINTED DATE: 19-APR-2001

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**PRODUCT NAME : STEAMATE PWR1440****PRODUCT APPLICATION AREA: NEUTRALIZING AMINE****COMPANY ADDRESS:**

BetzDearborn Inc.

4636 Somerton Road, Trevose, Pa. 19053

Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)**2) COMPOSITION / INFORMATION ON INGREDIENTS**

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:**CAS#****CHEMICAL NAME**

141-43-5

MONOETHANOLAMINE (ETHANOLAMINE)

Combustible; corrosive; irritant; may cause liver and kidney toxicity

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3) HAZARDS IDENTIFICATION**EMERGENCY OVERVIEW****DANGER**

Corrosive. Absorbed by skin. Corrosive to the eyes. Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

DOT hazard: Corrosive to skin

Emergency Response Guide #60

Odor: Amine; Appearance: Colorless To Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS**ACUTE SKIN EFFECTS:**

Primary route of exposure; Corrosive. Absorbed by skin.

ACUTE EYE EFFECTS:

Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:

Primary route of exposure; Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.

TARGET ORGANS:

Prolonged or repeated exposures may cause tissue necrosis and/or toxicity to the liver and kidney.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Inhalation may cause irritation of mucous membranes and respiratory tract. Skin contact causes severe irritation or burns.

PRODUCT NAME : STEAMATE PWR1440
EFFECTIVE DATE: 19-APR-2001

4) FIRST AID MEASURES

SKIN CONTACT:

Remove clothing. Wash area with large amounts of soap solution or water for 15 min. Immediately contact physician.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area. Apply necessary first aid treatment. Immediately contact a physician.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician.

Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

MISCELLANEOUS:

Corrosive to skin

UN2491;Emergency Response Guide #60

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Alkaline. Corrosive(Skin/eyes). Do not mix with acidic material.

STORAGE:

Keep containers closed when not in use. Do not freeze. If frozen, thaw and mix completely prior to use.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

MONOETHANOLAMINE (ETHANOLAMINE)

PEL (OSHA): 3 PPM(6PPM-STEL)

TLV (ACGIH): 3 PPM(6PPM-STEL)

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with organic vapor cartridges.

SKIN PROTECTION:

gauntlet-type neoprene gloves, chemical resistant apron--
Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles, face shield

EFFECTIVE DATE: 19-APR-2001

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.017	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	-9	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-23		
Viscosity(cps 70F, 21C)	20	% Solubility (water)	100.0
Odor		Amine	
Appearance		Colorless To Yellow	
Physical State		Liquid	
Flash Point	P-M(CC)	> 200F > 93C	
pH As Is (approx.)		12.7	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable · ND = not determined

10) STABILITY AND REACTIVITY**STABILITY:**

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with acids.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

NETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"C"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>5,000 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>5,000 mg/kg
NOTE - Estimated value	
Skin Irritation Score RABBIT:	CORROSIVE
NOTE - Based on similar product: EPA category I; DOT HM181 packing group III (240 min.)	
Eye Irritation Score RABBIT:	CORROSIVE
NOTE - Estimated value	
Non-Ames Mutagenicity BACTERIA:	NEGATIVE
NOTE - Based on testing of 100% active	

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Rainbow Trout 96 Hour Static Acute Bioassay

LC50: 370 mg/L

Fathead Minnow 96 Hour Flow-Thru Bioassay
Test concentrations were analytically verified.

0% Mortality: 1250 mg/L
10% Mortality: 2500 mg/L

Daphnia magna 48 Hour Flow-Thru Bioassay
Test concentrations were analytically verified.

LC50: 330 mg/L
No Effect Level: 70.5 mg/L

Bluegill Sunfish 96 Hour Static Acute Bioassay

LC50: 800 mg/L

Fathead Minnow 96 Hour Static Acute Bioassay

LC50: 500 mg/L
No Effect Level: 300 mg/L

BIODEGRADATION

COD (mg/gm): 560 Calculated
TOC (mg/gm): 152 Calculated
BOD-5 (mg/gm): 252 Calculated
BOD-28 (mg/gm): 250 Calculated

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002 = Corrosive(pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD: Corrosive to skin
UN / NA NUMBER: UN2491
DOT EMERGENCY RESPONSE GUIDE #: 60

PRODUCT NAME : STEAMATE PWR1440
EFFECTIVE DATE: 19-APR-2001

15) REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	3	Serious Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	ALK	pH above 12.0
(1) Protective Equipment	D	Goggles, Face Shield, Gloves, Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	29-JAN-1997		** NEW **
	07-MAY-1998	2	29-JAN-1997
	21-DEC-2000	12	07-MAY-1998
	19-APR-2001	12	21-DEC-2000

EFFECTIVE DATE: 21-AUG-1998
PRINTED DATE: 01-DEC-1999

CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : CORRSHIELD NT4203

PRODUCT APPLICATION AREA: WATER-BASED CORROSION INHIBITOR.

COMPANY ADDRESS:

BetzDearborn Inc.
4636 Somerton Road, Trevose, Pa. 19053
Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#

CHEMICAL NAME

7632-00-0

SODIUM NITRITE
Oxidizer; toxic (by ingestion); potential blood
toxin

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3) HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING

May cause moderate irritation to the skin. Severe irritant to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

DOT hazard: Corrosive to aluminum, toxic
Emergency Response Guide #154
Odor: Slight; Appearance: Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: Flood with water. Use of CO2 or foam may not be effective.

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:

Severe irritant to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

Toxic;
May cause gastrointestinal irritation with possible nausea, vomiting, diarrhea, incoordination, mental confusion, dizziness and lethargy.

TARGET ORGANS:

Prolonged or repeated exposures may cause CNS depression and/or toxicity to the blood.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

EFFECTIVE DATE: 21-AUG-1998

4) FIRST AID MEASURES**SKIN CONTACT:**

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Dilute contents of stomach. Induce vomiting by one of the standard methods. Immediately contact a physician.

NOTES TO PHYSICIANS:

No specific instruction

5) FIRE FIGHTING MEASURES**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

Flood with water. Use of CO2 or foam may not be effective.

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F . > 93C P-M(CC)

MISCELLANEOUS:

Corrosive to aluminum, toxic

2922 ;Emergency Response Guide #154

6) ACCIDENTAL RELEASE MEASURES**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.

Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Contains an oxidizer. Avoid all contact with reducing agents, oils, greases, organics and acids. Do not allow to dry.

STORAGE:

Keep containers closed when not in use. Protect from freezing.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

SODIUM NITRITE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.303	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	10	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-12		
Viscosity(cps 70F, 21C)	18	% Solubility (water)	100.0
Odor		Slight	
Appearance		Yellow	
Physical State		Liquid	
Flash Point	P-M(CC)	> 200F	> 93C
pH As Is (approx.)		12.2	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

10) STABILITY AND REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:

210 mg/kg

NOTE - Estimated value

Dermal LD50 RABBIT:

>2,000 mg/kg

NOTE - Estimated value

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Rainbow Trout 96 Hour Static Acute Bioassay

LC50: 303 mg/L

No Effect Level: 135 mg/L

Daphnia magna 48 Hour Static Acute Bioassay

LC50: 638 mg/L

No Effect Level: 240 mg/L

Fathead Minnow 96 Hour Acute Toxicity

Product toxicity determined from bioassays conducted on individual components.

LC50: 930 mg/L

No Effect Level: 620 mg/L

BIODEGRADATION

COD (mg/gm): 92 Calculated

TOC (mg/gm): Inorganic, N/A

BOD-5 (mg/gm): Inorganic, N/A

BOD-28 (mg/gm): Inorganic, N/A

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD: Corrosive to aluminum, toxic
UN / NA NUMBER: 2922
DOT EMERGENCY RESPONSE GUIDE #: 154

15) REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

23 gallons due to SODIUM NITRITE;

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

CAS#	CHEMICAL NAME	RANGE
7632-00-0	SODIUM NITRITE	31.0-40.0%

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

EFFECTIVE DATE: 21-AUG-1998

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	2	Moderate Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	28-JAN-1997		** NEW **
	28-APR-1997	3, 5, 14	28-JAN-1997
	21-AUG-1998	3, 5, 14	28-APR-1997

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

EFFECTIVE DATE: 25-JUN-2001

PRINTED DATE: 25-JUN-2001

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**PRODUCT NAME : SPECTRUS BD1500****PRODUCT APPLICATION AREA: WATER-BASED DEPOSIT CONTROL AGENT.****COMPANY ADDRESS:**

BetzDearborn Inc.

4636 Somerton Road, Trevose, Pa. 19053

Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)**2) COMPOSITION / INFORMATION ON INGREDIENTS**

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

This product is not hazardous as defined by OSHA regulations.

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3) HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable
Emergency Response Guide is not applicable
Odor: Slight; Appearance: Colorless, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause slight gastrointestinal irritation.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

PRODUCT NAME : SPECTRUS BD1500
EFFECTIVE DATE: 25-JUN-2001

4) FIRST AID MEASURES

SKIN CONTACT:

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C SETA(CC)

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.

- Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Alkaline. Do not mix with acidic material.

STORAGE:

Keep containers closed when not in use. Reasonable and safe chemical storage.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

This product is not hazardous as defined by OSHA regulations.

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

rubber gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.020	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	31	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-1		
Viscosity(cps 70F, 21C)	30	% Solubility (water)	100.0
Odor		Slight	
Appearance		Colorless	
Physical State		Liquid	
Flash Point	SETA(CC)	> 200F > 93C	
pH As Is (approx.)		12.5	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

EFFECTIVE DATE: 25-JUN-2001

10) STABILITY AND REACTIVITY**STABILITY:**

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"A"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>2,000 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	
Inhalation LC50 RAT:	>20 mg/L/hr
NOTE - Estimated value	

CONTINUED

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Rainbow Trout 48 Hour Static Screen

0% Mortality: 1000 mg/L

Menidia beryllina (Silversides) 96 Hour Static Acute Bioassay

0% Mortality: 5000 mg/L

Mysid Shrimp 96 Hour Static Acute Bioassay

25% Mortality: 5000 mg/L

No Effect Level: 2500 mg/L

Fathead Minnow 96 Hour Static Bioassay with 48-Hour Renewal
No mortality was observed in highest concentration tested.

0% Mortality: 2000 mg/L

Daphnia magna 48 Hour Static Acute Bioassay

No mortality was observed in highest concentration tested.

0% Mortality: 2000 mg/L

BIODEGRADATION

COD (mg/gm): 341 Calculated

TOC (mg/gm): 80 Calculated

BOD-5 (mg/gm): 4 Calculated

BOD-28 (mg/gm): 5 Calculated

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002 = Corrosive(pH):

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD: Not Applicable

UN / NA NUMBER: Not applicable

DOT EMERGENCY RESPONSE GUIDE #: Not applicable

PRODUCT NAME : SPECTRUS BD1500
EFFECTIVE DATE: 25-JUN-2001

15) REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS:

This product is composed of ingredients previously approved by USDA to meet G5 and G7 classification and may be used in water for cooking/cooling or in boiler or cooling systems with no food contact.

SARA SECTION 312 HAZARD CLASS:

Product is non-hazardous under Section 311/312

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	ALK	pH above 12.0
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	14-JUL-1997		** NEW **
	09-SEP-1998	15	14-JUL-1997
	15-SEP-1998	15	09-SEP-1998
	25-JUN-1999	11	15-SEP-1998
	02-APR-2001	12	25-JUN-1999
	25-JUN-2001	15	02-APR-2001

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

EFFECTIVE DATE: 03-OCT-1997
PRINTED DATE: 03-OCT-1997

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : POWERLINE 3627

PRODUCT APPLICATION AREA: BIOCIDES

COMPANY ADDRESS:

BetzDearborn Inc.
4636 Somerton Road, Trevose, Pa. 19053
Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#

CHEMICAL NAME

68391-01-5

(C12-18)ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE
Corrosive

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3) HAZARDS IDENTIFICATION

***** EMERGENCY OVERVIEW

DANGER

Corrosive to skin. Corrosive to the eyes. Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

DOT hazard: Corrosive to skin

Emergency Response Guide #60

Odor: Mild; Appearance: Colorless To Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

***** POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; Corrosive to skin.

ACUTE EYE EFFECTS:

Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:

Vapors, gases, mists and/or aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

May cause severe irritation or burning of mouth, throat, and gastrointestinal tract with severe chest and abdominal pain, nausea, vomiting, diarrhea, lethargy and collapse. Possible death when ingested in very large doses.

TARGET ORGANS:

Prolonged or repeated exposures may cause primary irritant dermatitis and/or tissue necrosis.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Inhalation of vapors/mists/aerosols may cause eye, nose, throat and lung irritation. Skin contact may cause severe irritation or burns.

PRODUCT NAME : POWERLINE 3627
EFFECTIVE DATE: 03-OCT-1997

4) FIRST AID MEASURES

SKIN CONTACT:

Remove clothing. Wash area with large amounts of soap solution or water for 15 min. Immediately contact physician.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area. Apply necessary first aid treatment. Immediately contact a physician.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

200F 93C P-M(CC)

MISCELLANEOUS:

Corrosive to skin

UN1903;Emergency Response Guide #60

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.

Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Dispose of in approved pesticide facility or according to label instructions.

PRODUCT NAME : POWERLINE 3627
EFFECTIVE DATE: 03-OCT-1997

7) HANDLING AND STORAGE

HANDLING:

Corrosive to skin. Corrosive to eyes.

STORAGE:

Keep containers closed when not in use. Protect from freezing. If frozen, thaw and mix completely prior to use. Atmospheric exposure should be minimized. Use approved containers only.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

(C12-18)ALKYL DIMETHYL BENZYL AMMONIUM CHLORIDE
PEL (OSHA): NOT DETERMINED
TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS:

If air-purifying respirator use is appropriate, use a respirator with organic vapor/acid gas cartridges and dust/mist prefilters.

SKIN PROTECTION:

gauntlet-type neoprene gloves, chemical resistant apron--
Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles, face shield

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	0.981	Vapor Pressure (mmHG)	~ 24.0
Freeze Point (F)	18	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-8		
Viscosity (cps 70F, 21C)	140	% Solubility (water)	100.0
Odor	Mild		
Appearance	Colorless To Yellow		
Physical State	Liquid		
Flash Point	P-M(CC)	200F	93C
pH As Is (approx.)	7.5		
Evaporation Rate (Ether=1)	< 1.00		

NA = not applicable ND = not determined

10) STABILITY AND REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

HAZARDOUS INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	735 mg/kg
Dermal LD50 RABBIT:	>3,350 mg/kg
Skin Irritation Score RABBIT:	CORROSIVE
Eye Irritation Score RABBIT:	CORROSIVE

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

No Data Available.

BIODEGRADATION

No Data Available.

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable:

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD:	Corrosive to skin
UN / NA NUMBER:	UN1903
DOT EMERGENCY RESPONSE GUIDE #:	60

15) REGULATORY INFORMATION

TSCA:

This is an EPA registered biocide and is exempt from TSCA inventory requirements.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

FIFRA REGISTRATION NUMBER:

10324-21-3876

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	3	Serious Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	D	Goggles, Face Shield, Gloves, Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	14-FEB-1996		** NEW **
	14-JAN-1997	3	14-FEB-1996
	03-OCT-1997	8	14-JAN-1997

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

EFFECTIVE DATE: 11-MAY-2001
PRINTED DATE: 11-MAY-2001

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : SPECTRUS NX1100

PRODUCT APPLICATION AREA: BIOCID

COMPANY ADDRESS:

BetzDearborn Inc.
4636 Somerton Road, Trevose, Pa. 19053
Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
52-51-7	2-BROMO-2-NITROPROPANE-1,3-DIOL Toxic (by ingestion); irritant (eyes); potential sensitizer (skin)
10377-60-3	MAGNESIUM NITRATE Oxidizer; irritant (eyes and skin)
26172-55-4	5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE Corrosive; toxic (by ingestion and skin absorption); sensitizer (skin)
7786-30-3	MAGNESIUM CHLORIDE Potential irritant

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

EFFECTIVE DATE: 11-MAY-2001

3) HAZARDS IDENTIFICATION**EMERGENCY OVERVIEW****DANGER**

Corrosive to skin. Skin sensitizer with delayed onset of symptoms.
Corrosive to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

DOT hazard: Corrosive to skin/steel
Emergency Response Guide #153
Odor: None; Appearance: Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media:
dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS**ACUTE SKIN EFFECTS:**

Primary route of exposure; Corrosive to skin. Skin sensitizer with delayed onset of symptoms.

ACUTE EYE EFFECTS:

Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

May cause severe irritation or burning of the gastrointestinal tract.

TARGET ORGANS:

Prolonged or repeated exposures may cause tissue necrosis and/or skin sensitization.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Direct contact with skin will cause severe delayed skin reactions or burns if not washed off immediately- follow first aid instructions.

PRODUCT NAME : SPECTRUS NX1100
EFFECTIVE DATE: 11-MAY-2001

4) FIRST AID MEASURES

SKIN CONTACT:

URGENT! Wash thoroughly with soap and water. Remove contaminated clothing. Get immediate medical attention. Thoroughly wash clothing before reuse.

EYE CONTACT:

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

MISCELLANEOUS:

Corrosive to skin/steel

UN3265;Emergency Response Guide #153

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Do not add decontaminant solution to waste drum containing biocide or adsorbent. Decontaminate floor residual with 10% metabisulfite solution. Use 10 volumes of solution to one volume of spill.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Dispose of in approved pesticide facility or according to label instructions.

PRODUCT NAME : SPECTRUS NX1100
EFFECTIVE DATE: 11-MAY-2001

7) HANDLING AND STORAGE

HANDLING:

Contains an oxidizer. Avoid all contact with reducing agents, oils, greases, organics and acids. Corrosive to skin and/or eyes.

STORAGE:

Keep containers closed when not in use. If frozen, thaw completely and mix thoroughly prior to use.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

2-BROMO-2-NITROPROPANE-1,3-DIOL

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

MAGNESIUM NITRATE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

MISC: Note-mfg. sugg. exp. limit:0.1 mg/m3 TWA;0.3mg/m3 STEL total isothiazoline).

MAGNESIUM CHLORIDE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with organic vapor/acid gas cartridges and dust/mist prefilters.

SKIN PROTECTION:

gauntlet-type butyl gloves, chemical resistant apron-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles, face shield

EFFECTIVE DATE: 11-MAY-2001

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.107	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	24	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-4		
Viscosity(cps 70F, 21C)	10	% Solubility (water)	100.0
Odor		None	
Appearance		Yellow	
Physical State		Liquid	
Flash Point	P-M(CC)	> 200F > 93C	
pH As Is (approx.)		3.0	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

10) STABILITY AND REACTIVITY**STABILITY:**

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

NETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	1,030 mg/kg
Dermal LD50 RABBIT:	>2,000 mg/kg
Skin Irritation Score RABBIT:	CORROSIVE
Eye Irritation Score RABBIT:	CORROSIVE
Skin Sensitization G.PIG:	NEGATIVE

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Fathead Minnow 96 Hour Static Renewal Bioassay

LC50: 3.5 mg/L
No Effect Level: 1.8 mg/L

Daphnia magna 48 Hour Static Renewal Bioassay

LC50: 5 mg/L
No Effect Level: 2.5 mg/L

Mysid Shrimp 48 Hour Static Renewal Bioassay

LC50: 40.5 mg/L
No Effect Level: 18 mg/L

Sheepshead Minnow 96 Hour Static Renewal Bioassay

LC50: 26.7 mg/L
No Effect Level: 15.5 mg/L

Ceriodaphnia 48 Hour Static Renewal Bioassay

LC50: 4.7 mg/L
No Effect Level: .63 mg/L

BIODEGRADATION

COD (mg/gm):	78 Calculated
TOC (mg/gm):	29 Calculated
BOD-5 (mg/gm):	2 Calculated
BOD-28 (mg/gm):	4 Calculated

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002 = Corrosive(steel).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD:	Corrosive to skin/steel
UN / NA NUMBER:	UN3265
DOT EMERGENCY RESPONSE GUIDE #:	153

PRODUCT NAME : SPECTRUS NX1100
EFFECTIVE DATE: 11-MAY-2001

15) REGULATORY INFORMATION

OSHA:

This is an EPA registered biocide and is exempt from TSCA inventory requirements.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

FIFRA REGISTRATION NUMBER:

3876-151

FOOD AND DRUG ADMINISTRATION:

21 CFR 176.300 & 176.170 (slimicides and as a preservative)

When used in this specified application, all ingredients comprising this product are authorized by FDA for the manufacture of paper and paperboard that may contact aqueous and fatty foods as per 21 CFR 176.170(a)(4).

USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS:

SEC.G7

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

CAS#

10377-60-3

CHEMICAL NAME

MAGNESIUM NITRATE

RANGE

2.0-5.0%

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	3	Serious Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	D	Goggles, Face Shield, Gloves, Apron

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	24-SEP-1997		** NEW **
	26-FEB-1998	12	24-SEP-1997
	20-MAY-1998	15	26-FEB-1998
	22-MAY-1998	2	20-MAY-1998
	07-JUL-1998	12	22-MAY-1998
	15-DEC-1998	7	07-JUL-1998
	01-APR-1999	12	15-DEC-1998
	05-NOV-1999	12	01-APR-1999
	11-MAY-2001	4	05-NOV-1999



GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 15-JAN-2002

EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

FLOGARD MS6201

PRODUCT APPLICATION AREA:

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

This product is not hazardous as defined by OSHA regulations.

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable

Emergency Response Guide is not applicable

Odor: Slight; Appearance: Colorless To Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause slight gastrointestinal irritation.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

4 FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C SETA(CC)

6 ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Contaminated area may be washed down with water.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 HANDLING & STORAGE

HANDLING:

Alkaline. Do not mix with acidic material.

STORAGE:

Keep containers closed when not in use. Reasonable and safe chemical storage.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

This product is not hazardous as defined by OSHA regulations.

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

rubber gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.729	Vapor Pressure (mmHG)	~ 15.0
Freeze Point (F)	< -30	Vapor Density (air=1)	< 1.00
Freeze Point (C)	< -34		
Viscosity(cps 70F, 21C)	78	% Solubility (water)	100.0

Odor	Slight
Appearance	Colorless To Yellow
Physical State	Liquid
Flash Point	SETA(CC) > 200F > 93C
pH As Is (approx.)	13.0
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxides.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"A"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT: >2,000 mg/kg
 NOTE - Estimated value
 Dermal LD50 RABBIT: >2,000 mg/kg
 NOTE - Estimated value
 Skin Irritation Score RABBIT: 0.5
 NOTE - EPA Category-IV: none to slight irritation; DOT HM181:
 noncorrosive

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Bluegill Sunfish 48 Hour Static Screen
 0% Mortality= 500 mg/L
 Daphnia magna 48 Hour Static Renewal Bioassay (pH adjusted)
 LC50= 660; No Effect Level= 268 mg/L
 Fathead Minnow 96 Hour Static Renewal Bioassay (pH adjusted)
 LC50= 785; No Effect Level= 423 mg/L

BIODEGRADATION

Product contains only inorganics that are not subject to typical biological degradation. Assimilation by microbes may occur in waste treatment or the environment.

13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
 D002=Corrosive (pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

DOT HAZARD: Not Applicable
 UN / NA NUMBER: Not applicable
 DOT EMERGENCY RESPONSE GUIDE #: Not applicable

15 REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

FOOD AND DRUG ADMINISTRATION:

21 CFR 176.170 (components of paper and paperboard in contact with aqueous and fatty foods)

USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS:

SEC.G2,G5,G7

SARA SECTION 312 HAZARD CLASS:

Product is non-hazardous under Section 311/312

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC

ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds
MICHIGAN REGULATORY INFORMATION.

No regulated constituent present at OSHA thresholds

16 OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	1	Slight Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	ALK	pH above 12.0
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	28-JAN-1997		** NEW **
	12-MAY-1997	15	28-JAN-1997
	29-MAY-1998	15	12-MAY-1997
	15-JUN-1998	15	29-MAY-1998
	31-MAY-2001	15	15-JUN-1998
	15-JAN-2002	4	31-MAY-2001

☒ Corporate_Logo**MATERIAL SAFETY DATA SHEET**

ISSUE DATE: 22-JAN-1998

BetzDearborn, Division of Hercules Incorporated
4636 Somerton Road
Trevose, PA 19053
Business telephone: (215) 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT)
(800) 877-1940 (USA)

HMIS RATINGS
(See Section 16 for
additional information)
HEALTH: 2
FLAMMABILITY: 1
REACTIVITY: 0

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

DEPOSITROL BL5301

PRODUCT APPLICATION AREA:

WATER-BASED DEPOSIT CONTROL AGENT.**2 COMPOSITION / INFORMATION ON INGREDIENTS**

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
2809-21-4	PHOSPHONIC ACID, (1-HYDROXYETHYLIDINE) BIS- (HEDP) Corrosive (eyes)

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW**CAUTION**

May cause moderate irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to

upper respiratory tract.

DOT hazard: Corrosive to steel
Emergency Response Guide #153
Odor: Mild; Appearance: Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water.

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause moderate irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause gastrointestinal irritation with possible nausea, vomiting, abdominal discomfort and diarrhea.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin, irritation, and/or tearing of eyes (direct contact).

4 FIRST AID MEASURES

SKIN CONTACT:

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

MISCELLANEOUS:

Corrosive to steel

UN3265; Emergency Response Guide #153

6 ACCIDENTAL RELEASE MEASURES**PROTECTION AND SPILL CONTAINMENT:**

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.

Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 HANDLING & STORAGE**HANDLING:**

Acidic. Do not mix with alkaline material.

STORAGE:

Keep containers closed when not in use. Use approved containers only. Store in cool, well-vented area. Contact with metals may release flammable hydrogen gas.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION**EXPOSURE LIMITS****CHEMICAL NAME**

PHOSPHONIC ACID, (1-HYDROXYETHYLIDINE) BIS- (HEDP)

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

rubber gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.406	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	< -30	Vapor Density (air=1)	< 1.00
Freeze Point (C)	< -34		
Viscosity (cps 70F, 21C)	80	% Solubility (water)	100.0
Odor	Mild		
Appearance	Yellow		
Physical State	Liquid		
Flash Point	P-M(CC) > 200F > 93C		
pH As Is (approx.)	< 1.0		
Evaporation Rate (Ether=1)	< 1.00		

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY**STABILITY:**

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>4,000 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>4,000 mg/kg
NOTE - Estimated value	
Eye Irritation Score RABBIT:	9.3
NOTE - Maximum score at 48 hr; completely reversible by day 14	

12 ECOLOGICAL INFORMATION**AQUATIC TOXICOLOGY**

Daphnia magna 48 Hour Static Screen

0% Mortality= 500 mg/L

Fathead Minnow 48 Hour Static Screen

0% Mortality= 500 mg/L

BIODEGRADATION

BOD-28 (mg/g): 7

BOD-5 (mg/g): 3

COD (mg/g): 329

TOC (mg/g): 89

13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA

hazardous waste identification number is :
D002=Corrosive(pH, steel).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

DOT HAZARD: Corrosive to steel
UN / NA NUMBER: UN3265
DOT EMERGENCY RESPONSE GUIDE #: 153

15 REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

SARA SECTION 312 HAZARD CLASS:

Immediate(acute)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	2	Moderate Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	CORR	DOT corrosive
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	29-JAN-1997		** NEW **
	22-JAN-1998		29-JAN-1997



GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 21-JAN-2002

EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

INHIBITOR AZ8101

PRODUCT APPLICATION AREA:

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
29385-43-1	1-H-BENZOTRIAZOLE, METHYL- (TOLYLTRIAZOLE; TTA) Solid is an irritant (by all routes); liquid is corrosive
1310-73-2	SODIUM HYDROXIDE (CAUSTIC SODA) Corrosive; toxic (by ingestion)

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard: Corrosive to aluminum, RQ
Emergency Response Guide #154
Odor: None; Appearance: Light Amber, Liquid

Fire fighters should wear positive pressure self-contained breathing

apparatus(full face-piece type). Proper fire-extinguishing media:
dry chemical/CO2/foam or water--slippery condition; use sand/grit.

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes..

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause slight gastrointestinal irritation.

TARGET ORGANS:

Prolonged or repeated exposures may cause primary irritant dermatitis.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

4 FIRST AID MEASURES

SKIN CONTACT:

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical/CO2/foam or water--slippery condition; use sand/grit.

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C SETA(CC)

MISCELLANEOUS:

Corrosive to aluminum, RQ
UN3266;Emergency Response Guide #154

6 ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:
Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 HANDLING & STORAGE

HANDLING:

Alkaline. Do not mix with acidic material.

STORAGE:

Keep containers closed when not in use. If frozen, thaw completely and mix thoroughly prior to use.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

1-H-BENZOTRIAZOLE, METHYL- (TOLYLTRIAZOLE; TTA)

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

SODIUM HYDROXIDE (CAUSTIC SODA)

PEL (OSHA): 2 MG/M3

TLV (ACGIH): 2 MG/M3 (CEILING)

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

rubber gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.077	Vapor Pressure (mmHG)	- 18.0
Freeze Point (F)	13	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-11		
Viscosity(cps 70F, 21C)	6	% Solubility (water)	100.0
Odor	None		
Appearance	Light Amber		
Physical State	Liquid		
Flash Point	SETA(CC)	> 200F > 93C	
pH As Is (approx.)	12.8		
Evaporation Rate (Water=1)	ND		

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT: >3,000 mg/kg

NOTE - Estimated value

Dermal LD50 RABBIT: >5,000 mg/kg

NOTE - Estimated value

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Screen

0% Mortality= 500 mg/L

Fathead Minnow 96 Hour Acute Toxicity (Estimated)

LC50= 520; No Effect Level= 380 mg/L

Rainbow Trout 96 Hour Static Acute Bioassay

LC50= 88.1; No Effect Level= 42 mg/L

BIODEGRADATION

BOD-28 (mg/g): 9

BOD-5 (mg/g): 0

COD (mg/g): 293

TOC (mg/g): 94

13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
D002=Corrosive(pH).

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

DOT HAZARD: Corrosive to aluminum, RQ

UN / NA NUMBER: UN3266

DOT EMERGENCY RESPONSE GUIDE #: 154

15 REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS:

SEC.G5,G7

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC

ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	ALK	pH above 12.0
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	28-JAN-1997		** NEW **
	16-APR-1997	15	28-JAN-1997
	28-APR-1997	3,5,14	16-APR-1997
	23-JUN-1997	3,5,14	28-APR-1997
	21-JAN-2002	15	23-JUN-1997

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

EFFECTIVE DATE: 17-MAY-2001

PRINTED DATE: 17-MAY-2001

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**PRODUCT NAME : BETZ DTG****PRODUCT APPLICATION AREA: A DETOXIFYING AGENT****COMPANY ADDRESS:**

BetzDearborn Inc.

4636 Somerton Road, Trevose, Pa. 19053

Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)**2) COMPOSITION / INFORMATION ON INGREDIENTS**

Information for specific product ingredients as required by the
U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to
additional sections of this MSDS for our assessment of the potential
hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
14808-60-7	RESPIRABLE QUARTZ (CRYSTALLINE SILICA) Irritant (respiratory); probable human carcinogen (IARC=2A; NTP=anticipated); may cause long term lung disease (silicosis)

3) HAZARDS IDENTIFICATION*****
EMERGENCY OVERVIEW**CAUTION**

Non-hazardous to skin. Potential eye irritant due to mechanical action only. Dusts may cause irritation to the upper respiratory tract. Inhalation may result in shortness of breath and reduced pulmonary function.

DOT hazard is not applicable
Emergency Response Guide is not applicable
Odor: None; Appearance: Gray To Brown, Granules

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media:
dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS**ACUTE SKIN EFFECTS:**

Non-hazardous to skin.

ACUTE EYE EFFECTS:

Potential eye irritant due to mechanical action only.

ACUTE RESPIRATORY EFFECTS:

Primary route of exposure;Dusts may cause irritation to the upper respiratory tract. Inhalation may result in shortness of breath and reduced pulmonary function.

INGESTION EFFECTS:

May cause slight gastrointestinal irritation.

TARGET ORGANS:

Prolonged or repeated exposures may cause silicosis and may increase risk of cancer.

MEDICAL CONDITIONS AGGRAVATED:

Respiratory ailments.

SYMPTOMS OF EXPOSURE:

Inhalation of the dust may cause irritation to the upper respiratory tract and create breathing difficulties such as shortness of breath.

4) FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing.
Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get medical attention if irritation persists after flushing.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician.
Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.
Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Keep dry.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

CHEMICAL NAME EXPOSURE LIMITS

RESPIRABLE QUARTZ (CRYSTALLINE SILICA)

PEL (OSHA): 0.1 MG/M3

TLV (ACGIH): 0.05 MG/M3 RESPERABLE FRACTION

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

rubber gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

safety glasses

9) PHYSICAL AND CHEMICAL PROPERTIES

Density	58.000 lb/cu.	Vapor Pressure (mmHG)	< 1.0
Freeze Point (F)	NA	Vapor Density (air=1)	< 1.00
Freeze Point (C)	NA		
Viscosity(cps 70F,21C)	NA	% Solubility (water)	0.0
Odor	None		
Appearance	Gray To Brown		
Physical State	Granules		
Flash Point	P-M(CC)	> 200F > 93C	
pH 5% Susp. (approx.)	8.8		
Evaporation Rate (Ether=1)	< 1.00		

NA = not applicable ND = not determined

EFFECTIVE DATE: 17-MAY-2001

10) STABILITY AND REACTIVITY**STABILITY:**

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT: >2,000 mg/kg

NOTE - Estimated value

Dermal LD50 RABBIT: >2,000 mg/kg

NOTE - Estimated value

12) ECOLOGICAL INFORMATION**AQUATIC TOXICOLOGY**

Daphnia magna 48 Hour Static Screen

No mortality was observed in highest concentration tested.

No Effect Level: 2000 mg/L

BIODEGRADATION

No Data Available.

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD: Not Applicable

UN / NA NUMBER: Not applicable

DOT EMERGENCY RESPONSE GUIDE #: Not applicable

CONTINUED

15) REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

POTABLE WATER APPROVAL:

NSF certified. Maximum use 200 mg/L

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

This product contains these chemicals known to the state of
California to cause cancer or reproductive toxicity:

CAS#

14808-60-7

CHEMICAL NAME

RESPIRABLE QUARTZ (CRYSTALLINE SILICA)

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

UNFPA/HMIS

CODE TRANSLATION

Health	0	Minimal Hazard
Fire	0	Minimal Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	A	Safety Glasses

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	22-AUG-1995	REVISED FORMAT	** NEW **
	17-JUN-1996	15	22-AUG-1995
	09-OCT-1996	12	17-JUN-1996
	04-JUN-1997	15	09-OCT-1996
	19-MAR-2001	4	04-JUN-1997
	17-MAY-2001	8	19-MAR-2001

EFFECTIVE DATE: 17-MAY-2001
PRINTED DATE: 17-MAY-2001

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : BETZ DTS

PRODUCT APPLICATION AREA: A DETOXIFYING AGENT

COMPANY ADDRESS:

BetzDearborn Inc.
4636 Somerton Road, Trevose, Pa. 19053
Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
14464-46-1	RESPIRABLE CRISTOBALITE (CRYSTALLINE SILICA) Irritant (respiratory); probable human carcinogen (IARC=2A; NTP=anticipated); may cause long term lung disease (silicosis)
14808-60-7	RESPIRABLE QUARTZ (CRYSTALLINE SILICA) Irritant (respiratory); probable human carcinogen (IARC=2A; NTP=anticipated); may cause long term lung disease (silicosis)
15468-32-3	RESPIRABLE TRIDYMITE (CRYSTALLINE SILICA) Irritant (respiratory); probable human carcinogen (IARC=2A; NTP=anticipated); may cause long term lung disease (silicosis)

3) HAZARDS IDENTIFICATION*****
EMERGENCY OVERVIEW**CAUTION**

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable

Emergency Response Guide is not applicable

Odor: Slight; Appearance: Green-Brown, Dispersion

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS**ACUTE SKIN EFFECTS:**

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause gastrointestinal irritation with possible nausea, vomiting, headache, dizziness, unconsciousness and injury to the kidneys and liver. Small amounts aspirated during ingestion/vomiting may cause lung injury, possibly death.

TARGET ORGANS:

Prolonged or repeated exposures may cause toxicity to the liver and/or kidney.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

PRODUCT NAME : BETZ DTS
EFFECTIVE DATE: 17-MAY-2001

4) FIRST AID MEASURES

SKIN CONTACT:

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician.

Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.

Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Do not freeze. If frozen, thaw and mix completely prior to use.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

CHEMICAL NAME	EXPOSURE LIMITS
RESPIRABLE CRISTOBALITE (CRYSTALLINE SILICA)	
PEL (OSHA): 0.05 MG/M3	
TLV (ACGIH): 0.05 MG/M3	
RESPIRABLE QUARTZ (CRYSTALLINE SILICA)	
PEL (OSHA): 0.1 MG/M3	
TLV (ACGIH): 0.05 MG/M3 RESPERABLE FRACTION	
RESPIRABLE TRIDYMITE (CRYSTALLINE SILICA)	
PEL (OSHA): 0.05 MG/M3	
TLV (ACGIH): 0.05 MG/M3	

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

rubber gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.186	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	32	Vapor Density (air=1)	< 1.00
Freeze Point (C)	0		
Viscosity(cps 70F, 21C)	2900	% Solubility (water)	0.0
Odor		Slight	
Appearance		Green-Brown	
Physical State		Dispersion	
Flash Point	P-M(CC)	> 200F > 93C	
pH As Is (approx.)		7.0	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

EFFECTIVE DATE: 17-MAY-2001

10) STABILITY AND REACTIVITY**STABILITY:**

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

BETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT: >2,000 mg/kg

NOTE - Estimated value

Dermal LD50 RABBIT: >2,000 mg/kg

NOTE - Estimated value

12) ECOLOGICAL INFORMATION**AQUATIC TOXICOLOGY**

Fathead Minnow 96 Hour Static Screen

0% Mortality: 435 mg/L

Daphnia magna 48 Hour Static Screen

0% Mortality: 435 mg/L

BIODEGRADATION

COD (mg/gm): 64 Calculated

TOC (mg/gm): 26 Calculated

BOD-5 (mg/gm): 0 Calculated

BOD-28 (mg/gm): 2 Calculated

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is:
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

PRODUCT NAME : BETZ DTS
EFFECTIVE DATE: 17-MAY-2001

14) TRANSPORT INFORMATION

DOT HAZARD: Not Applicable
UN / NA NUMBER: Not applicable
DOT EMERGENCY RESPONSE GUIDE #: Not applicable

15) REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

Treat as oil spill

SARA SECTION 312 HAZARD CLASS:

Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

**CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

This product contains these chemicals known to the state of
California to cause cancer or reproductive toxicity:

CAS#	CHEMICAL NAME
14464-46-1	RESPIRABLE CRISTOBALITE (CRYSTALLINE SILICA)
14808-60-7	RESPIRABLE QUARTZ (CRYSTALLINE SILICA)
15468-32-3	RESPIRABLE TRIDYMITE (CRYSTALLINE SILICA)

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

NFPA/HMIS		CODE TRANSLATION
Health.	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	22-AUG-1995	REVISED FORMAT	** NEW **
	17-JUN-1996	15	22-AUG-1995
	17-MAY-2001	8	17-JUN-1996



GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 16-APR-1998

EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

CONTINUUM AEC3145

PRODUCT APPLICATION AREA:

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

This product is not hazardous as defined by OSHA regulations.

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3 HAZARDS IDENTIFICATION

***** EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable
Emergency Response Guide is not applicable
Odor: Mild; Appearance: Colorless To Yellow, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

***** POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause gastrointestinal irritation with possible nausea, vomiting, abdominal discomfort and diarrhea.

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

4 FIRST AID MEASURES

SKIN CONTACT:

Remove contaminated clothing. Wash exposed area with a large quantity of soap solution or water for 15 minutes.

EYE CONTACT:

Immediately flush eyes with water for 15 minutes. Immediately contact a physician for additional treatment.

INHALATION:

Remove victim from contaminated area to fresh air. Apply appropriate first aid treatment as necessary.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No special instructions

5 FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6 ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 HANDLING & STORAGE

HANDLING:

Normal chemical handling.

STORAGE:

Keep containers closed when not in use. Store in cool ventilated location. Store away from oxidizers.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

This product is not hazardous as defined by OSHA regulations.

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.
USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.
If air-purifying respirator use is appropriate, use a respirator with dust/mist filters.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.251	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	20	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-7		
Viscosity (cps 70F, 21C)	30	% Solubility (water)	100.0

Odor	Mild
Appearance	Colorless To Yellow
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH As Is (approx.)	3.8
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"A"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT: >2,000 mg/kg
NOTE - Estimated value
Dermal LD50 RABBIT: >2,000 mg/kg
NOTE - Estimated value

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Acute Toxicity (Estimated)
LC50= 820; No Effect Level= 160 mg/L
Fathead Minnow 96 Hour Acute Toxicity (Estimated)
LC50= 1230; No Effect Level= 400 mg/L

BIODEGRADATION

BOD-28 (mg/g): 17
BOD-5 (mg/g): 8
COD (mg/g): 209
TOC (mg/g): 91

13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

DOT HAZARD: Not Applicable
UN / NA NUMBER: Not applicable
DOT EMERGENCY RESPONSE GUIDE #: Not applicable

15 REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

SARA SECTION 312 HAZARD CLASS:

Product is non-hazardous under Section 311/312

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC

ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
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MSDS status: 16-APR-1998		** NEW **

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

EFFECTIVE DATE: 01-NOV-1999

PRINTED DATE: 11-NOV-1999

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : CORTROL OS5613

**PRODUCT APPLICATION AREA: WATER BASED DISSOLVED OXYGEN
SCAVENGER/METAL PASSIVATOR.**

COMPANY ADDRESS:

BetzDearborn Inc.

4636 Somerton Road, Trevose, Pa. 19053

Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)

2) COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#

CHEMICAL NAME

497-18-7

CARBONIC DIHYDRAZIDE

Exothermic hydrolysis to hydrazine can occur with high temperature; also occurs by contact with alkalies, oxidizers, or low grade metals; irritant (eyes and skin)

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

Avoid contact with low grade metals (LCS, Al, Cu), alkalies and oxidizers to avoid accelerated actives degradation.

Do not mix with other chemicals. Feed independently to system.

3) HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause moderate irritation to the eyes. Mists/aerosols may cause irritation to upper respiratory tract.

DOT hazard is not applicable

Emergency Response Guide is not applicable

Odor: Slight; Appearance: Colorless To Light Yell Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; May cause slight irritation to the skin.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols may cause irritation to upper respiratory tract.

INGESTION EFFECTS:

May cause gastrointestinal irritation..

TARGET ORGANS:

No evidence of potential chronic effects.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

May cause redness or itching of skin.

4) FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

No specific instruction

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7) HANDLING AND STORAGE

HANDLING:

Contact with oxidizers, peroxide and metal oxide may result in a violent reaction. Contamination with high pH products and low grade metal accelerate decomposition to hydrazine.

STORAGE:

Keep containers closed when not in use. Store in a manner that minimizes potential contamination. Store only in vented containers. Protect from freezing.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

CARBONIC DIHYDRAZIDE

PEL (OSHA): NOT DETERMINED

TLV (ACGIH): NOT DETERMINED

ENGINEERING CONTROLS:

adequate ventilation

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with ammonia/methylamine cartridges.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.041	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	32	Vapor Density (air=1)	< 1.00
Freeze Point (C)	0		
Viscosity (cps, 70F, 21C)	12	% Solubility (water)	100.0
Odor		Slight	
Appearance		Colorless To Light Yellow	
Physical State		Liquid	
Flash Point	P-M(CC)	> 200F > 93C	
pH As Is (approx.)		9.0	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

10) STABILITY AND REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

ETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	>2,000 mg/kg
NOTE - Estimated value	
Dermal LD50 RABBIT:	>2,000 mg/kg
NOTE - Estimated value	

12) ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Renewal Bioassay

LC50: 460 mg/L

No Effect Level: 100 mg/L

Fathead Minnow 96 Hour Static Renewal Bioassay

Mortality was observed in lowest concentration tested. A no effect level cannot be defined.

LC50: 140 mg/L

5% Mortality: 52 mg/L

Ceriodaphnia 48 Hour Static Renewal Bioassay

Mortality was observed in lowest concentration tested. A no effect level cannot be defined.

LC50: 92 mg/L

10% Mortality: 52 mg/L

BIODEGRADATION

No Data Available.

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD:	Not Applicable
UN / NA NUMBER:	Not applicable
DOT EMERGENCY RESPONSE GUIDE #:	Not applicable

15) REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

No regulated constituent present at OSHA thresholds

SARA SECTION 312 HAZARD CLASS:

Immediate(acute)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles,Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
MSDS status:	25-MAY-1999		** NEW **
	20-JUL-1999	12	25-MAY-1999
	30-AUG-1999	4;EDIT:9	20-JUL-1999
	01-NOV-1999	4,8	30-AUG-1999

MATERIAL SAFETY DATA SHEET

MSDS Number: 428000RV

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: BORID 10oz., 1lb., 5lb., 25lb., 50lb., & 100lb. - EPA REGISTRATION # 9444-129

Manufactured by: Waterbury Companies, Inc.
P.O. Box 640
Independence, LA 70443
24-Hour Emergency Contact:
800-424-9300 (CHEMTREC)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components greater than 1.0% (0.1% if carcinogen or suspected carcinogen)

Component	CAS#	OSHA PEL	ACGIH TLV	Other Limits	% by wt
Orthoboric Acid (Boric Acid)*	10043-35-3	N.E.	N.E.	N.E.	99
Tricalcium Phosphate- Foodgrade	7758-87-4				<5

* This item is NOT a carcinogen, but has been listed to aid in the identification of all pesticide active ingredients in the product. Actual percentages for these active ingredients have been listed vs. percent ranges.

3. HAZARDS IDENTIFICATION

It is a violation of federal law to use this product in a manner inconsistent with its labeling. Read label. Application of this product in the food area of food handling establishments other than as a crack and crevice treatment are not permitted.

Potential Health Effects:

Routes of Entry: Inhalation: Yes Ingestion: Yes Skin: Yes

Health Hazards: Large amounts absorbed into blood stream from ingestion or through damaged skin may result in erythema, macular rash, nausea, diarrhea, dizziness, depression, CNS effects after 24 hours, through broken skin or 36-72 hours from ingestion. May cause slight irritation to broken skin. Animal studies have shown that ingestion of large amounts of Borates over prolonged periods of time causes a decrease in sperm production and testicle size in male laboratory animals and developmental effects in fetuses of pregnant female laboratory animals. No evidence of such effects in humans.

Signs/symptoms of overexposure: INGESTION: Acute oral LD50 (rats) 3.16 g/Kg. May cause nausea, vomiting, diarrhea in doses >15gms. EYES: May cause slight, reversible conjunctivitis. SKIN: May cause slight irritation on damaged skin. Acute dermal LD50 > 2g/Kg (rabbits) INHALATION: Nuisance dust. May cause transitory sneezing and coughing.

Medical conditions aggravated by exposure: None known.

MATERIAL SAFETY DATA SHEET

MSDS Number: 428000RV

NFPA Hazard Ratings Fire: 0 Health 1 Reactivity: 0

NFPA 704 Ratings are subject to interpretation and are only intended for general identification of the level of the specific hazard. All information must be considered for proper safe handling of the material.

4. FIRST AID MEASURES

IF SWALLOWED: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. If person is unconscious, do not give anything by mouth and do not induce vomiting. IF IN EYES: Flush eyes with plenty of water. Call a physician if irritation persists. NOTE TO PHYSICIAN: After ingestion or absorption into the bloodstream of large amounts (> 15gms.), symptoms may appear in 24-72 hours. Borates are readily dissipated through the urine (70% in the first 24 hours).

5. FIRE FIGHTING MEASURES

Extinguishing Media: N/A

Fire Fighting Procedures: None Required.

Unusual Fire and Explosion Hazards: None Known - Product is an inherent fire retardant.

6. ACCIDENTAL RELEASE MEASURES

Sweep or vacuum. Flush area with water.

7. HANDLING AND STORAGE

No powder should be visible in living areas after application. Any powder visible after application must be brushed into cracks and crevices or removed. Apply only in areas inaccessible to children and pets. Avoid contamination of feed and foodstuffs. Do not use in serving areas when food is exposed. Do not use in edible product areas. Apply approximately 1 pound for every 1,000 square feet of living space.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Gloves: Not required - avoid contact with skin.

Eye Protection: Not required - avoid contact with eyes.

Respiratory Protection: N/A

Ventilation: Local: Not required.

Mechanical: Not required.

Other protective equipment: Safety glasses to avoid possible contact with eyes is recommended.

Protective Work/Hygiene Practices: Follow label instructions.

MATERIAL SAFETY DATA SHEET**MSDS Number: 428000RV****9. PHYSICAL AND CHEMICAL PROPERTIES***Specific Gravity (H₂O=1):* N/A*Vapor Pressure (mm Hg):* N/A*Solubility:* 4.7% @68 degrees F.*Appearance/Odor:* Light blue odorless powder.*Flashpoint:* Not applicable.*LEL:* N/A*UEL:* N/A*Boiling Point:* N/A*Melting Point:* 340 deg. F**10. STABILITY AND REACTIVITY***Conditions to Avoid:* Contact with acetic anhydride or elemental potassium.*Incompatible Materials:* Acetic anhydride, elemental potassium.*Hazardous Decomposition By-products:* None known.*Hazardous Polymerization Conditions:* None known.**11. TOXICOLOGICAL INFORMATION**

This product contains no chemicals that are listed on the NTP, IARC, or OSHA carcinogen lists. Any further information on the toxicology of the material can be obtained by contacting the manufacturer.

12. ECOLOGICAL INFORMATION

Please call the manufacturer for questions concerning the ecological effects of this product and its constituents.

13. DISPOSAL CONSIDERATIONS

Wastes resulting from the use of this product may be disposed of on site or at an approved waste facility.

14. TRANSPORT INFORMATION

	<i>Status</i>	<i>Shipping Name</i>	<i>Class</i>	<i>ID #</i>	<i>Pkng Grp</i>
<i>DOT (USA):</i>	Not Regulated	Sodium Borate	N/A	N/A	N/A
<i>IATA (Air):</i>	Not Regulated	N/A	N/A	N/A	N/A
<i>IMDG (Vessel):</i>	N/A	N/A	N/A	N/A	N/A

National Motor Freight Classification and LTL Class: 43520 - CLASS 55**15. REGULATORY INFORMATION**

This product is authorized for use in plants operating under USDA Inspection and Grading Programs as a CATEGORY F2 Substance

MATERIAL SAFETY DATA SHEET**MSDS Number:** 428000RV**SARA Title III Section 31** When completing Tier II reports, the following information should be used

Note: See state and local regulations for specifics on reporting requirements for your facility.

This product should be described as: PURE: N MIXTURE Y SOLID: Y

LIQUID: N GAS: N

Physical Hazards: FIRE: N PRESSURE: N REACTIVITY: N*Health Hazards:* IMMEDIATE: Y DELAYED: N**16. OTHER INFORMATION****Product Sales Information:** 800-845-3495**MSDS Information:** 985-878-6751**Revision Notes:** MSDS revised to comply with ANSI Z400.1-1998 16-Section MSDS format.

N/A = Not Applicable

N.E. = Not Established

MSDS Prepared by K.G.

This Information is provided in good faith, but no warranty, expressed or implied, is made. The manufacturer believes that it is accurate and to the best of its knowledge, and relates only to the specific material designated herein.

**BETZDEARBORN MATERIAL
SAFETY DATA SHEET**

EFFECTIVE DATE: 15-NOV-2000

PRINTED DATE: 15-NOV-2000

1) CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**PRODUCT NAME : SPECTRUS NX118****PRODUCT APPLICATION AREA: BIOCIDES****COMPANY ADDRESS:**

BetzDearborn Inc.

4636 Somerton Road, Trevose, Pa. 19053

Information phone number: (215) - 355-3300

EMERGENCY TELEPHONE (HEALTH/ACCIDENT): (800)-877-1940 (USA)**2) COMPOSITION / INFORMATION ON INGREDIENTS**

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#	CHEMICAL NAME
57-55-6	PROPYLENE GLYCOL HIGH VOC
6317-18-6	METHYLENE BIS(THIOCYANATE) Corrosive (eyes); toxic (by ingestion); irritant (skin); potential sensitizer (skin)

No component is considered to be a carcinogen by the National Toxicology Program, the International Agency for Research on Cancer, or the Occupational Safety and Health Administration at OSHA thresholds for carcinogens.

3) HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER

Severe irritant to the skin. Potential skin sensitizer. Corrosive to the eyes. Mists/aerosols cause irritation to the upper respiratory tract.

DOT hazard: Toxic
Emergency Response Guide #55
Odor: Mild; Appearance: Light Tan, Dispersion

Fire fighters should wear positive pressure self-contained breathing apparatus(full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS

ACUTE SKIN EFFECTS:

Primary route of exposure; Severe irritant to the skin. Potential skin sensitizer.

ACUTE EYE EFFECTS:

Corrosive to the eyes.

ACUTE RESPIRATORY EFFECTS:

Mists/aerosols cause irritation to the upper respiratory tract.

INGESTION EFFECTS:

Toxic;
May cause severe gastrointestinal irritation with possible nausea, vomiting, diarrhea, incoordination, mental confusion and lethargy.

TARGET ORGANS:

Prolonged or repeated exposures may cause allergic contact dermatitis.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Causes severe irritation, burns or tissue ulceration with subsequent scarring.

4) FIRST AID MEASURES

SKIN CONTACT:

Wash thoroughly with soap and water. Remove contaminated clothing. Thoroughly wash clothing before reuse. Get medical attention if irritation develops or persists.

EYE CONTACT:

URGENT! Immediately flush eyes with plenty of low-pressure water for at least 20 minutes while removing contact lenses. Hold eyelids apart. Get immediate medical attention.

INHALATION:

If nasal, throat or lung irritation develops - remove to fresh air and get medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Dilute contents of stomach. Induce vomiting by one of the standard methods. Immediately contact a physician.

NOTES TO PHYSICIANS:

No special instructions

5) FIRE FIGHTING MEASURES

FIRE FIGHTING INSTRUCTIONS:

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

MISCELLANEOUS:

Toxic

UN2810;Emergency Response Guide #55

6) ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container. Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Dispose of in approved pesticide facility or according to label instructions.

7) HANDLING AND STORAGE

HANDLING:

Corrosive to eyes.

STORAGE:

Keep containers closed when not in use. Protect from freezing. Do not store at elevated temperatures.

8) EXPOSURE CONTROLS/PERSONAL PROTECTION

CHEMICAL NAME	EXPOSURE LIMITS
---------------	-----------------

PROPYLENE GLYCOL	
------------------	--

PEL (OSHA): NOT DETERMINED	
----------------------------	--

TLV (ACGIH): NOT DETERMINED	
-----------------------------	--

METHYLENE BIS(THIOCYANATE)	
----------------------------	--

PEL (OSHA): NOT DETERMINED	
----------------------------	--

TLV (ACGIH): NOT DETERMINED	
-----------------------------	--

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with organic vapor cartridges and dust/mist prefilters.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

PRODUCT NAME : SPECTRUS NX118
EFFECTIVE DATE: 15-NOV-2000

9) PHYSICAL AND CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	1.036	Vapor Pressure (mmHG)	~ 18.0
Freeze Point (F)	23	Vapor Density (air=1)	< 1.00
Freeze Point (C)	-5		
Viscosity (cps 70F, 21C)	950	% Solubility (water)	5.0
Odor		Mild	
Appearance		Light Tan	
Physical State		Dispersion	
Flash Point	P-M(CC)	> 200F > 93C	
pH As Is (approx.)		3.0	
Evaporation Rate (Ether=1)		< 1.00	

NA = not applicable ND = not determined

10) STABILITY AND REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

NETZDEARBORN INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11) TOXICOLOGICAL INFORMATION

Oral LD50 RAT:	290 mg/kg
Dermal LD50 RABBIT:	>2,000 mg/kg
DOT Skin Corrosivity RABBIT:	
NOTE - Not corrosive	
Skin Irritation Score RABBIT:	CORROSIVE
Eye Irritation Score RABBIT:	
NOTE - Maximally irritating	

12) ECOLOGICAL INFORMATION**AQUATIC TOXICOLOGY**

Fathead Minnow 96 Hour Static Renewal Bioassay

LC50: .79 mg/L

No Effect Level: .49 mg/L

Daphnia magna 48 Hour Static Renewal Bioassay

LC50: .51 mg/L

No Effect Level: .3 mg/L

Bluegill Sunfish 96 Hour Static Acute Bioassay

LC50: 2.7 mg/L

Rainbow Trout 96 Hour Static Acute Bioassay

LC50: 2.4 mg/L

BIODEGRADATION

COD (mg/gm): 640

TOC (mg/gm): 180

BOD-5 (mg/gm): 0

BOD-28 (mg/gm): 3

13) DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14) TRANSPORT INFORMATION

DOT HAZARD:

Toxic


UN / NA NUMBER:

UN2810

DOT EMERGENCY RESPONSE GUIDE #: 55

PRODUCT NAME : SPECTRUS NX118
EFFECTIVE DATE: 15-NOV-2000

15) REGULATORY INFORMATION

 **TSCA:**

This is an EPA registered biocide and is exempt from TSCA inventory requirements.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

Treat as oil spill

FIFRA REGISTRATION NUMBER:

9386-4-3876

FOOD AND DRUG ADMINISTRATION:

The ingredients in this product are approved by FDA under 21 CFR 176.300.

SARA SECTION 312 HAZARD CLASS:

Immediate(acute);Delayed(Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION

**CALIFORNIA SAFE DRINKING WATER AND TOXIC
ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16) OTHER INFORMATION

NFPA/HMIS

CODE TRANSLATION

Health	3	Serious Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	22-OCT-1997		** NEW **
	26-FEB-1998	3, 5, 8, 11, 12, 14, 15, 16; E	22-OCT-1997
	06-MAR-1998	3, 5, 14	26-FEB-1998
	26-MAY-1998	3, 5, 14	06-MAR-1998
	28-OCT-1999	2, 8	26-MAY-1998
	10-NOV-1999	3, 4, 5, 14	28-OCT-1999
	10-FEB-2000	12	10-NOV-1999
	15-NOV-2000	; EDIT: 9	10-FEB-2000

MATERIAL SAFETY DATA SHEET

EQUILON MSDS: 9248E-08 10/17/96

ETHYLENE GLYCOL - INDUSTRIAL GRADE

TELEPHONE NUMBER:

24 HOUR EMERGENCY ASSISTANCE

EQUIVA SERVICES: 877-276-7283

GENERAL MSDS ASSISTANCE

877-276-7285

CHEMTREC: 800-424-9300

NAME AND ADDRESS

EQUILON ENTERPRISES LLC

PRODUCT STEWARDSHIP

P.O. BOX 674414

HOUSTON, TX 77267-4414

SECTION I.

NAME

PRODUCT: ETHYLENE GLYCOL - INDUSTRIAL GRADE

CHEM NAME: ETHANE-1,2-DIOL, EG

CHEM FAMILY: GLYCOL

SHELL CODE: 32374 94001

HEALTH HAZARD: 3 FIRE HAZARD: 1 REACTIVITY: 0

SECTION II-A

PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NO.	PERCENT
P	ETHYLENE GLYCOL - INDUSTRIAL GRADE	MIXTURE	100
1	ETHYLENE GLYCOL	107-21-1	>99

SECTION II-B

ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
1	4.0 G/KG (RAT)	NONE	NONE

SECTION III

HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT: PRODUCT IS MODERATELY TO SEVERELY IRRITATING TO THE EYES. VAPORS CAN ALSO CAUSE SEVERE EYE IRRITATION.

SKIN CONTACT: PRODUCT IS MILDLY IRRITATING TO THE SKIN AND SLIGHTLY TOXIC ON PROLONGED OR REPEATED CONTACT.

INHALATION: VAPORS OR AEROSOLS MAY BE IRRITATING TO THE RESPIRATORY SYSTEM AND MAY BE TOXIC ON PROLONGED OR REPEATED EXPOSURE.

INGESTION: PRODUCT MAY BE HARMFUL OR FATAL IF SWALLOWED; MAY PRODUCE CENTRAL NERVOUS SYSTEM (CNS) DEPRESSION AND KIDNEY DAMAGE WHICH MAY BE FATAL.

SIGNS AND SYMPTOMS: IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS DEPRESSION MAY BE EVIDENCED BY GIDDINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONSCIOUSNESS AND DEATH MAY OCCUR. KIDNEY DAMAGE MAY BE EVIDENCED BY CHANGES IN URINE OUTPUT, URINE APPEARANCE OR EDEMA (SWELLING FROM FLUID RETENTION).

AGGRAVATED MEDICAL CONDITIONS:

PREEXISTING SKIN, EYE, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED KIDNEY FUNCTION FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS:

INTENTIONAL ABUSE, MISUSE OR OTHER MASSIVE EXPOSURE MAY CAUSE MULTIPLE ORGAN DAMAGE AND/OR DEATH.

SEE SECTION VI FOR ADDITIONAL INFORMATION.

SECTION IV

OCCUPATIONAL EXPOSURE LIMITS

69014923-2

COMP NO. PEL/TWA	OSHA PEL/CEILING	TLV/TWA	ACGIH TLV/STEL	OTHER
1	50 PPM	39.4 PPM*		
* CEILING (AEROSOL)				

SECTION V

EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT: FLUSH SKIN WITH WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION: REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION: DO NOT GIVE LIQUIDS IF VICTIM IS UNCONSCIOUS OR VERY DROWSY. OTHERWISE, GIVE NO MORE THAN 2 GLASSES OF WATER AND INDUCE VOMITING BY GIVING 30CC (2 TABLESPOONS) SYRUP OF IPECAC.* IF IPECAC IS UNAVAILABLE, GIVE 2 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF VICTIM'S THROAT. KEEP VICTIM'S HEAD BELOW HIPS WHILE VOMITING. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN: *IF VICTIM IS A CHILD, GIVE NO MORE THAN 1 GLASS OF WATER AND 15CC (1 TABLESPOON) SYRUP OF IPECAC. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE SHOULD BE CONSIDERED FOLLOWING INTUBATION WITH A CUFFED ENDOTRACHEAL TUBE.

SECTION VI

SUPPLEMENTAL HEALTH INFORMATION

RARE CASE REPORTS OF SENSITIZATION (ALLERGY) HAVE BEEN PUBLISHED BUT ALLERGY TO ETHYLENE GLYCOL IS NOT A COMMON PHENOMENON.

IN ONE STUDY, WHEN ETHYLENE GLYCOL WAS ADMINISTERED IN THE DIET AT DAILY DOSES UP TO 1.0 G/KG TO PREGNANT RATS, NO MATERNAL TOXICITY, NO EMBRYOTOXICITY NOR TERATOGENICITY WERE OBSERVED. IN A MORE RECENT STUDY, WHEN ETHYLENE GLYCOL WAS ADMINISTERED BY GAVAGE AT DAILY DOSES OF 1.25 G/KG AND ABOVE TO PREGNANT RATS, OR AT 750 MG/KG AND ABOVE TO PREGNANT MICE, THERE WAS AN INCREASE IN THE NUMBER OF MALFORMED FETUSES AT ALL DOSE LEVELS. EXCEPT AT THE LOWEST DOSE LEVEL IN MICE, THERE WAS ALSO EVIDENCE OF MATERNAL TOXICITY AT ALL DOSE LEVELS.

SECTION VII

PHYSICAL DATA

BOILING POINT (DEG F): 380-400	SPECIFIC GRAVITY (H2O = 1): 1.12 @ 60 DEG. F	VAPOR PRESSURE (MM HG): .06 @ 68 DEG F
MELTING POINT (DEG F): 9	SOLUBILITY IN WATER: COMPLETE	VAPOR DENSITY (AIR = 1): 2.1 VOC: 100% @ 9.308 LB/GAL

EVAPORATION RATE (NORMAL BUTYL ACETATE = 1): <0.01

APPEARANCE AND ODOR: COLORLESS, SLIGHTLY VISCOUS LIQUID. MILD ODOR.

PHYS/CHEM PROPERTIES: SEE ABOVE FOR DETAILS

SECTION VIII

FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD: 244 DEG F PMCC

FLAMMABLE LIMITS/PERCENT VOLUME IN AIR: LOWER: N/AP HIGHER: N/AP

EXTINGUISHING MEDIA:
USE WATER FOG, "ALCOHOL" FOAM, DRY CHEMICAL OR CO2.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS:
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED

BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.
UNUSUAL FIRE AND EXPLOSION HAZARDS:
NONE IDENTIFIED

SECTION IX

REACTIVITY

STABILITY: STABLE HAZARDOUS POLYMERIZATION WILL NOT OCCUR
CONDITIONS AND MATERIALS TO AVOID:
KEEP AWAY FROM STRONG OXIDIZING AGENTS.
HAZARDOUS DECOMPOSITION PRODUCTS:
CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING
COMBUSTION.

SECTION X

EMPLOYEE PROTECTION

RESPIRATORY PROTECTION:

IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A
NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR
1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING
RESPIRATOR FOR ORGANIC VAPORS.

PROTECTIVE CLOTHING

AVOID CONTACT WITH EYES. WEAR CHEMICAL GOGGLES IF THERE IS LIKELIHOOD OF
CONTACT WITH EYES. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR
CHEMICAL-RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT.
TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS
INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE, NEOPRENE, PVC OR NATURAL
RUBBER GLOVES.

ADDITIONAL PROTECTIVE MEASURES:

USE VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. EYE WASH
FOUNTAINS AND SAFETY SHOWERS SHOULD BE AVAILABLE FOR EMERGENCY USE.

SECTION XI

ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES:

MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING
UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE
CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND
CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK
UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL;
DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. ***
SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

SECTION XII

SPECIAL PRECAUTIONS

STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM FLAMES
AND HIGH TEMPERATURES.
WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET
FACILITIES. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.
DO NOT PRESSURIZE DRUM CONTAINERS TO EMPTY THEM.
NOT FOR USE IN THE MANUFACTURE OF FOODS OR PHARMACEUTICALS.

SECTION XIII

TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:

CLASS 9 (OTHER REGULATED SUBSTANCES), III

DOT PROPER SHIPPING NAME: OTHER REGULATED SUBSTANCES, LIQUID, N.O.S. (CONTAINS
ETHYLENE GLYCOL)

OTHER REQUIREMENTS: NA3082, GUIDE 171. REGULATED ONLY IN PACKAGES THAT CONTAIN
5000 LBS OR GREATER OF ETHYLENE GLYCOL.

SECTION XIV

OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL

SUBSTANCES.

PROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 1990): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV

STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	CAS NO	PERCENT	STATE CODE
ETHYLENE GLYCOL	107-21-1	>99	CA, CT, FL, IL, LA, MA, ME, MN, NJ, PA, RI
DIETHYLENE GLYCOL	111-46-6	<.5	CA, MN, PA, RI

CA = CALIFORNIA HAZ. SUBST. LIST; CA65C, CA65R, CA65C/R = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 OR PROPOSITION 65 LIST; CT = CONNECTICUT TOX. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ. SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

SECTION XVI

SPECIAL NOTES

THIS MSDS REVISION HAS CHANGES IN SECTIONS XII AND XIII.

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE TO US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT DATA. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH RESPECT TO THE PRODUCT, UNDERLYING DATA OR THE INFORMATION CONTAINED HEREIN. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE, AND ARE ENCOURAGED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE THE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, YOU SHOULD CONSULT WITH YOUR LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. WE WILL NOT PROVIDE ADVICE ON SUCH MATTERS, OR BE RESPONSIBLE FOR ANY INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN. THE UNDERLYING DATA, AND THE INFORMATION PROVIDED HEREIN AS A RESULT OF THAT DATA, IS THE PROPERTY OF EQUIVA SERVICES, LLC AND IS NOT TO BE THE SUBJECT OF SALE OR EXCHANGE WITHOUT THE EXPRESS WRITTEN CONSENT OF EQUIVA SERVICES, LLC.

ENVIRONMENTAL DATA SHEET

EQUILON EDS: 9248E

ETHYLENE GLYCOL - INDUSTRIAL GRADE

TELEPHONE NUMBER:

24 HOUR EMERGENCY ASSISTANCE

EQUIVA SERVICES: 877-276-7283

CHEMTREC: 800-424-9300

NAME AND ADDRESS

EQUILON ENTERPRISES

PRODUCT STEWARDSHIP

P.O. BOX 674414

HOUSTON, TX 77267-4414

GENERAL MSDS ASSISTANCE

877-276-7285

<http://www.equivashellmsds.com/msds.asp?id=170706>

07/18/2001

PRODUCT CODE: 94001

SECTION I		PRODUCT COMPOSITION	
NO.	COMPOSITION	CAS	PERCENT
P	ETHYLENE GLYCOL - INDUSTRIAL GRADE	MIXTURE	100
1	ETHYLENE GLYCOL	107-21-1	>99

SECTION II			SARA TITLE III INFORMATION		
NO.	EHS RQ (*1)	EHS TPQ (*2)	SEC-313 (*3)	313 CATEGORY (*4)	311/312 CATEGORY (*5)
P					H-1, H-2
1			YES		

- *1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
 *2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
 *3 = TOXIC CHEMICAL, SEC 313
 *4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
 *5 = CATEGORY (FOR AGGREGATE REPORTING REQUIREMENTS UNDER SARA 311, 312)
 HEALTH: H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD
 H-2 = DELAYED (CHRONIC) HEALTH HAZARD
 PHYSICAL: P-3 = FIRE HAZARD
 P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
 P-5 = REACTIVE HAZARD

SECTION III		ENVIRONMENTAL RELEASE INFORMATION
		EPA - COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT. UNDER EPA-CERCLA ("SUPERFUND") RELEASES TO AIR, LAND OR WATER WHICH EXCEED THE REPORTABLE QUANTITY MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.
		THE REPORTABLE QUANTITY (RQ) FOR A RELEASE OF THIS PRODUCT IS 5,000 LBS., WHICH IS BASED ON THE PRESENCE OF COMPONENT #1.

SECTION IV		RCRA INFORMATION
		PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.
		THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

SHELL OIL COMPANY
 P.O. BOX 4320
 HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
 (713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
 SHELL: (713) 473-9461
 CHEMTREC: (800) 424-9300

GE Betz, Inc.
4636 Somerton Road
Trevose, PA 19053
Business telephone: (215) 355-3300

Material Safety Data Sheet

Issue Date: 06-OCT-2000

EMERGENCY TELEPHONE (Health/Accident): (800) 877-1940

1 PRODUCT IDENTIFICATION

PRODUCT NAME:

FOAMTROL AF1440

PRODUCT APPLICATION AREA:

ANTIFOAM.

RECEIVED

AUG 19 2002

2 COMPOSITION / INFORMATION ON INGREDIENTS

Information for specific product ingredients as required by the U.S. OSHA HAZARD COMMUNICATION STANDARD is listed. Refer to additional sections of this MSDS for our assessment of the potential hazards of this formulation.

HAZARDOUS INGREDIENTS:

CAS#

CHEMICAL NAME

64741-44-2

DISTILLATES, PETROLEUM, STRAIGHT-RUN MIDDLE
similar petroleum oils have been shown to cause
skin tumors in laboratory animals following
lifetime exposure without washing or removal.

3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION

May cause slight irritation to the skin. May cause dermatitis. May cause moderate irritation to the eyes. Moderate, prolonged exposure may cause headache. May cause chemical pneumonitis if aspirated into lungs.

DOT hazard is not applicable
Emergency Response Guide is not applicable
Odor: Hydrocarbon; Appearance: Amber, Liquid

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type). Proper fire-extinguishing media: dry chemical, carbon dioxide, foam or water

POTENTIAL HEALTH EFFECTS**ACUTE SKIN EFFECTS:**

Primary route of exposure; May cause slight irritation to the skin.
May cause dermatitis.

ACUTE EYE EFFECTS:

May cause moderate irritation to the eyes.

ACUTE RESPIRATORY EFFECTS:

Moderate, prolonged exposure may cause headache. May cause chemical pneumonitis if aspirated into lungs.

INGESTION EFFECTS:

May cause slight gastrointestinal irritation. Small amounts aspirated during ingestion or vomiting may cause lung injury, possibly leading to death.

TARGET ORGANS:

Prolonged or repeated exposures may cause defatting-type dermatitis. Lifetime skin painting studies in mice have produced skin tumors.

MEDICAL CONDITIONS AGGRAVATED:

Not known.

SYMPTOMS OF EXPOSURE:

Prolonged exposure may cause drying and cracking of skin.

4 FIRST AID MEASURES**SKIN CONTACT:**

Wash thoroughly with soap and water. Remove contaminated clothing. Get medical attention if irritation develops or persists.

EYE CONTACT:

Remove contact lenses. Hold eyelids apart. Immediately flush eyes with plenty of low-pressure water for at least 15 minutes. Get immediate medical attention.

INHALATION:

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get immediate medical attention.

INGESTION:

Do not feed anything by mouth to an unconscious or convulsive victim. Do not induce vomiting. Immediately contact physician. Dilute contents of stomach using 3-4 glasses milk or water.

NOTES TO PHYSICIANS:

This product contains a hydrocarbon solvent. Aspiration into the lungs will result in chemical pneumonia and may be fatal.

5 FIRE FIGHTING MEASURES**FIRE FIGHTING INSTRUCTIONS:**

Fire fighters should wear positive pressure self-contained breathing apparatus (full face-piece type).

EXTINGUISHING MEDIA:

dry chemical, carbon dioxide, foam or water

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

FLASH POINT:

> 200F > 93C P-M(CC)

6 ACCIDENTAL RELEASE MEASURES

PROTECTION AND SPILL CONTAINMENT:

Ventilate area. Use specified protective equipment. Contain and absorb on absorbent material. Place in waste disposal container.

Flush area with water. Wet area may be slippery. Spread sand/grit.

DISPOSAL INSTRUCTIONS:

Water contaminated with this product may be sent to a sanitary sewer treatment facility, in accordance with any local agreement, a permitted waste treatment facility or discharged under a permit. Product as is - Incinerate or land dispose in an approved landfill.

7 HANDLING & STORAGE

HANDLING:

Vent carefully before opening.

STORAGE:

Keep containers closed when not in use. Store between 90-110F to prevent crystallization. If storage is below 90F, warm and mix prior to use to ensure homogeneity. Store away from oxidizers.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMITS

CHEMICAL NAME

DISTILLATES, PETROLEUM, STRAIGHT-RUN MIDDLE

PEL (OSHA): 5 MG/M3

TLV (ACGIH): 5 MG/M3

ENGINEERING CONTROLS:

Adequate ventilation to maintain air contaminants below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

Use protective equipment in accordance with 29CFR 1910 Subpart I

RESPIRATORY PROTECTION:

A RESPIRATORY PROTECTION PROGRAM THAT MEETS OSHA'S 29 CFR 1910.134 AND ANSI Z88.2 REQUIREMENTS MUST BE FOLLOWED WHENEVER WORKPLACE CONDITIONS WARRANT A RESPIRATOR'S USE.

USE AIR PURIFYING RESPIRATORS WITHIN USE LIMITATIONS ASSOCIATED WITH THE EQUIPMENT OR ELSE USE SUPPLIED AIR-RESPIRATORS.

If air-purifying respirator use is appropriate, use a respirator with organic vapor cartridges.

SKIN PROTECTION:

neoprene gloves-- Wash off after each use. Replace as necessary.

EYE PROTECTION:

splash proof chemical goggles

9 PHYSICAL & CHEMICAL PROPERTIES

Specific Grav. (70F, 21C)	0.867	Vapor Pressure (mmHG)	< 1.0
Freeze Point (F)	18	Vapor Density (air=1)	> 1.00
Freeze Point (C)	-8		
Viscosity (cps 70F, 21C)	11	% Solubility (water)	0.0

Odor

Hydrocarbon

Appearance	Amber
Physical State	Liquid
Flash Point	P-M(CC) > 200F > 93C
pH 5% Emulsion (approx.)	5.6
Evaporation Rate (Ether=1)	< 1.00

NA = not applicable ND = not determined

10 STABILITY & REACTIVITY

STABILITY:

Stable under normal storage conditions.

HAZARDOUS POLYMERIZATION:

Will not occur.

INCOMPATIBILITIES:

May react with strong oxidizers.

DECOMPOSITION PRODUCTS:

Thermal decomposition (destructive fires) yields elemental oxides.

INTERNAL PUMPOUT/CLEANOUT CATEGORIES:

"B"

11 TOXICOLOGICAL INFORMATION

Oral LD50 RAT: >2,000 mg/kg

NOTE - Estimated value

Dermal LD50 RABBIT: >2,000 mg/kg

12 ECOLOGICAL INFORMATION

AQUATIC TOXICOLOGY

Daphnia magna 48 Hour Static Acute Bioassay

LC50= 98.2; No Effect Level= 37 mg/L

Rainbow Trout 96 Hour Static Acute Bioassay

LC50= 100; No Effect Level= 75 mg/L

BIODEGRADATION

BOD-28 (mg/g): 285

BOD-5 (mg/g): 138

COD (mg/g): 1486

TOC (mg/g): 500

13 DISPOSAL CONSIDERATIONS

If this undiluted product is discarded as a waste, the US RCRA hazardous waste identification number is :
Not applicable.

Please be advised; however, that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

DOT HAZARD: Not Applicable

UN / NA NUMBER: Not applicable

DOT EMERGENCY RESPONSE GUIDE #: Not applicable

15 REGULATORY INFORMATION

TSCA:

All components of this product are listed in the TSCA inventory.

CERCLA AND/OR SARA REPORTABLE QUANTITY (RQ):

Treat as oil spill

FOOD AND DRUG ADMINISTRATION:

21 CFR 176.210 (defoaming agents used in the manufacture of paper and paperboard)

When used in this specified application, all ingredients comprising this product are authorized by FDA for the manufacture of paper and paperboard that may contact aqueous and fatty foods as per 21 CFR 176.170(a)(4).

USDA FEDERALLY INSPECTED MEAT AND POULTRY PLANTS:

SEC.G7,L1

SARA SECTION 312 HAZARD CLASS:

Immediate (acute); Delayed (Chronic)

SARA SECTION 302 CHEMICALS:

No regulated constituent present at OSHA thresholds

SARA SECTION 313 CHEMICALS:

No regulated constituent present at OSHA thresholds

CALIFORNIA REGULATORY INFORMATION**CALIFORNIA SAFE DRINKING WATER AND TOXIC****ENFORCEMENT ACT (PROPOSITION 65) CHEMICALS PRESENT:**

No regulated constituent present at OSHA thresholds

MICHIGAN REGULATORY INFORMATION

No regulated constituent present at OSHA thresholds

16 OTHER INFORMATION**NFPA/HMIS****CODE TRANSLATION**

Health	1	Slight Hazard
Fire	1	Slight Hazard
Reactivity	0	Minimal Hazard
Special	NONE	No special Hazard
(1) Protective Equipment	B	Goggles, Gloves

(1) refer to section 8 of MSDS for additional protective equipment recommendations.

CHANGE LOG

	EFFECTIVE DATE	REVISIONS TO SECTION:	SUPERCEDES
	-----	-----	-----
MSDS status:	29-JAN-1997		** NEW **
	01-JUL-1997	15	29-JAN-1997
	30-APR-1998	;EDIT:9	01-JUL-1997
	09-MAR-2000	15	30-APR-1998
	20-SEP-2000	2,15	09-MAR-2000
	06-OCT-2000	3,4	20-SEP-2000

Material Safety Data Sheet

Ammonium Hydroxide

ACC# 01260

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Hydroxide**Catalog Numbers:** A470-250, A512 500, A512-500, A512500, A564-200L, A564-20L, A564-212L, A564-500, A667 212, A667-212, A667212, A669 212, A669 500, A669 612GAL, A669-212, A669-385LB, A669-500, A669-612G, A669-612GAL, A669-612GL, A669212, A669385LB, A669500, A669612GAL, A669C 212, A669C-2.5, A669C-212, A669C212, A669FP 500, A669FP500, A669S 212, A669S 500, A669S-2.5, A669S-212, A669S-500, A669S212, A669S212E, A669S212EA, A669S212LC, A669S500, A699P 500, A699P500, S70663MF, S70665, S70665-1, S70665MF, SCH 1143, SCH1143**Synonyms:** Ammonium Hydrate; Ammonia Solution; Ammonia Water; Aqueous Ammonia.**Company Identification:**Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410**RECEIVED****OCT 08 2001****For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1336-21-6	Ammonium hydroxide	57.0	215-647-6
7732-18-5	Water	43.0	231-791-2

Hazard Symbols: T C**Risk Phrases:** 25 34

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colourless. **Danger!** Corrosive. Toxic. Lachrymator. Harmful if swallowed. Causes eye and skin burns. Causes digestive and respiratory tract burns.**Target Organs:** Eyes, skin, mucous membranes.**Potential Health Effects****Eye:** Contact with liquid or vapor causes severe burns and possible irreversible eye damage.**Skin:** Causes severe skin irritation. Causes skin burns. May cause deep, penetrating ulcers of the skin. Contact with the skin may cause staining, inflammation, and thickening of the skin.**Ingestion:** Harmful if swallowed. May cause severe and permanent damage to the digestive tract. Causes gastrointestinal tract burns. Causes throat constriction, vomiting, convulsions, and

shock.

Inhalation: Effects may be delayed. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma.

Chronic: Chronic ingestion may cause effects similar to those of acute ingestion. Prolonged or repeated exposure may cause corneal damage and the development of cataracts and glaucoma.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation with water is required (at least 30 minutes).

Skin: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid immediately. Wash clothing before reuse.

Ingestion: If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: After inhalation exposure, observe for 24 to 72 hours as pulmonary edema may be delayed.

Section 5 - Firefighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Extinguishing Media: For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. Do NOT get water inside containers. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Neutralize spill with a weak acid such as vinegar or acetic acid. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Do not get in eyes, on skin, or on clothing. Keep

Container tightly closed. Do not ingest or inhale. Discard contaminated shoes.

Storage: Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium hydroxide	none listed	none listed	none listed
Water	none listed	none listed	none listed

OSHA Vacated PELs: Ammonium hydroxide: No OSHA Vacated PELs are listed for this chemical. Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: colourless

Odor: strong odor - ammonia-like

pH: 13.6 at 32F.

Vapor Pressure: 115 mm Hg @20C

Vapor Density: 1.2 (Air=1)

Evaporation Rate: 1 (Water=1)

Viscosity: Not available.

Boiling Point: 36 deg C

Freezing/Melting Point: -77 deg C

Decomposition Temperature: Not available.

Autoignition Temperature: 1202 deg F (650.00 deg C)

Flash Point: Not available.

NFPA Rating: Not published.

Explosion Limits, Lower: 16.0

Upper: 27.0

Solubility: Completely soluble in water.

Specific Gravity/Density: 0.9

Molecular Formula: Not applicable.

Molecular Weight: Not available.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, incompatible materials.

Incompatibilities with Other Materials: Acrolein, acrylic acid, chlorosulfonic acid, dimethyl sulfate, fluorine, gold + aqua regia, hydrochloric acid, hydrofluoric acid, iodine, nitric acid, oleum, propiolactone, propylene oxide, silver nitrate, silver oxide, silver oxide + ethyl alcohol, nitromethane, silver permanganate, sulfuric acid, halogens. Forms explosive compounds with many heavy metals and halide salts.

Hazardous Decomposition Products: Nitric oxide (NOx) and ammonia (NH3) fumes.

Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#:

CAS# 1336-21-6 unlisted.

CAS# 7732-18-5 unlisted.

LD50/LC50:

CAS# 1336-21-6:

Draize test, rabbit, eye: 250 ug Severe;

Draize test, rabbit, eye: 44 ug Severe;

Oral, rat: LD50 = 350 mg/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

Carcinogenicity:

CAS# 1336-21-6: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. **CAS# 7732-18-5:** Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: No information available.

Other Studies: Standard Draize Test: Administration into the eye (rabbit) = 250 ug (Severe).

Section 12 - Ecological Information

Ecotoxicity: Bluegill LC50=0.024 to 0.093 mg/L/48H Goldfish TLm=2.0 to 2.5 mg/L/24-96H

Environmental Fate: No information reported.

Physical/Chemical: No information available.

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	AMMONIA SOLUTIONS				AMMONIUM HYDROXIDE
Hazard Class:	8				8(9.2)
UN Number:	UN2672				UN2672
Packing Group:	III				III

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 1336-21-6 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 1336-21-6: final RQ = 1000 pounds (454 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1336-21-6: acute, chronic.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 1336-21-6 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1336-21-6 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T C

69006602-6

Risk Phrases:

R 25 Toxic if swallowed. R 34 Causes burns.

Safety Phrases:

S 24/25 Avoid contact with skin and eyes. S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 1336-21-6: 2

CAS# 7732-18-5: No information available.

Canada

CAS# 1336-21-6 is listed on Canada's DSL/NDSL List.

CAS# 7732-18-5 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D1B, E.

CAS# 1336-21-6 is listed on Canada's Ingredient Disclosure List.

CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits**Section 16 - Additional Information****MSDS Creation Date:** 6/22/1999**Revision #3 Date:** 1/15/2001

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Ammonium Chloride

ACC# 01170

Section 1 - Chemical Product and Company Identification

MSDS Name: Ammonium Chloride**Catalog Numbers:** AC9470862, S70609, S70609-1, S70609-2, S70609-3, A649 3, A649 500, A649-3, A649-500, A64910KG, A6493, A649500, A661 10, A661 3, A661 500, A661-10, A661-3, A661-500, A66110, A6613, A661500, NC9483471, NC9483488, NC9528216, NC9570959, S706091, S706092, S706093, XXA649EP10KG**Synonyms:** Ammonium Chloratum, Ammonium Chloridum, Ammonium Muriate, Sal Ammonia, Salmiac.**Company Identification:**Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
12125-02-9	Ammonium chloride	>99.0	235-186-4

Hazard Symbols: XN**Risk Phrases:** 22 36

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless or white. **Caution!** May cause skin irritation. May be harmful if swallowed. May cause respiratory and digestive tract irritation. Causes eye irritation.**Target Organs:** None.**Potential Health Effects****Eye:** Causes eye irritation.**Skin:** May cause skin irritation.**Ingestion:** May cause irritation of the digestive tract. May cause systemic toxicity with acidosis. May be harmful if swallowed.**Inhalation:** If heated, dust or fume may cause respiratory tract irritation.**Chronic:** Prolonged or repeated skin contact may cause dermatitis.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: Induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Firefighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Substance is noncombustible. Containers may explode in the heat of a fire. May polymerize explosively when involved in a fire.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Substance is noncombustible; use agent most appropriate to extinguish surrounding fire. For large fires, use water spray, fog or alcohol-resistant foam. Cool containers with flooding quantities of water until well after fire is out.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid ingestion and inhalation.

Storage: Store in a cool, dry, well-ventilated area away from incompatible substances. Store below 40°C.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ammonium chloride	10 mg/m3; 20 mg/m3 STEL	10 mg/m3 TWA	none listed

OSHA Vacated PELs: Ammonium chloride: 10 mg/m3 TWA

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear impervious gloves.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless or white

Odor: odorless

pH: 5.0 (10% sol at 25C)

Vapor Pressure: 1 mm Hg @ 160.4C

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 520 deg C(sublimes)

Freezing/Melting Point: 328 deg C

Decomposition Temperature: Not available.

Autoignition Temperature: Not available.

Flash Point: Not available.

NFPA Rating: (estimated) Health: 1; Flammability: 0; Reactivity: 0

Explosion Limits, Lower: Not available.

Upper: Not available.

Solubility: 39.6% at 176F.

Specific Gravity/Density: 1.53 (Water=1)

Molecular Formula: NH₄Cl

Molecular Weight: 53.4877

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.

Conditions to Avoid: Incompatible materials, excess heat.

Incompatibilities with Other Materials: Acids, alkalis, and their associated carbonates.

Substance reacts with lead and silver salts to form a fulminating compound. Substance reacts with ammonium compounds, bromine pentafluoride, bromine trifluoride, hydrogen cyanide, iodine heptafluoride, nitrates, and potassium chlorate.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, ammonia and hydrochloric acid fumes.

Hazardous Polymerization: May occur.

Section 11 - Toxicological Information

RTECS#:**CAS#** 12125-02-9: BP4550000**LD50/LC50:****CAS#** 12125-02-9:

Oral, mouse: LD50 = 1300 mg/kg;

Oral, rat: LD50 = 1650 mg/kg;

Carcinogenicity:**CAS#** 12125-02-9: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.**Epidemiology:** No information available.**Teratogenicity:** No information available.**Reproductive Effects:** No information available.**Neurotoxicity:** No information available.**Mutagenicity:** Cytogenetic analysis: hamster fibroblast, 400 mg/L.**Other Studies:** None.

Section 12 - Ecological Information

Ecotoxicity: Sunfish (fresh water) TLm=6 ppm/96H**Environmental Fate:** No information reported.**Physical/Chemical:** No information available.**Other:** None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.				AMMONIUM CHLORIDE
Hazard Class:					9.2
UN Number:					UN9085
Packing Group:					III
Additional Info:					REGULATED LIMIT 230KG

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 12125-02-9 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 12125-02-9: final RQ = 5000 pounds (2270 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 12125-02-9: acute, chronic.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 12125-02-9 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 12125-02-9 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN

Risk Phrases:

R 22 Harmful if swallowed. R 36 Irritating to eyes.

Safety Phrases:

S 22 Do not breathe dust.

WGK (Water Danger/Protection)

CAS# 12125-02-9: 1

Canada

CAS# 12125-02-9 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D2B.

CAS# 12125-02-9 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 12125-02-9: OEL-ARAB Republic of Egypt:TWA 10 mg/m3 (fume) OEL
-AUSTRALIA:TWA 10 mg/m3;STEL 20 mg/m3 (fume) OEL-BELGIUM:TWA 10 mg/m3
;STEL 20 mg/m3 (fume) OEL-DENMARK:TWA 10 mg/m3 (fume) OEL-FRANCE:TWA

10 mg/m³ (fume) OEL-THE NETHERLANDS:TWA 10 mg/m³ (fume) OEL-RUSSIA:
STEL 10 mg/m³ (fume) OEL-SWITZERLAND:TWA 6 mg/m³ (fume) OEL-UNITED K
INGDOM:TWA 10 mg/m³;STEL 20 mg/m³ (fume) OEL IN BULGARIA, COLOMBIA, J
ORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM c
heck ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 6/15/1999

Revision #1 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Lithium Hydroxide Anhydrous

ACC# 12925

Section 1 - Chemical Product and Company Identification

MSDS Name: Lithium Hydroxide Anhydrous**Catalog Numbers:** L128 500, L128-500, L128500, ZZL1281519, ZZL1282019**Synonyms:** Lithium Hydrate**Company Identification:**

Fisher Scientific

1 Reagent Lane

Fair Lawn, NJ 07410

For information, call: 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1310-65-2	LITHIUM HYDROXIDE	>99	215-183-4

Hazard Symbols: C**Risk Phrases:** 35

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white. **Danger!** Corrosive. May cause kidney damage. May cause central nervous system effects. May cause cardiac disturbances. Causes eye and skin burns. Causes digestive and respiratory tract burns.

Target Organs: Kidneys, central nervous system, cardiovascular system.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns. May cause eye injury.

Skin: Contact with liquid is corrosive and causes severe burns and ulceration. Chronic ingestion may cause dizziness, ringing in the ears, visual disturbances, tremors, and mental confusion. Prolonged absorption may affect electrolyte balance and impair kidney function. Dehydration, weight loss, skin effects, and thyroid disturbances have been reported.

Ingestion: May cause kidney damage. May cause circulatory system failure. May cause cardiac disturbances. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract. May cause tremors and convulsions.

Inhalation: Irritation may lead to chemical pneumonitis and pulmonary edema. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma. May cause effects similar to those described for ingestion.

Chronic: Chronic inhalation and ingestion may cause effects similar to those of acute inhalation

and ingestion. Chronic ingestion may cause dizziness, ringing in the ears, visual disturbances, tremors, and mental confusion. Prolonged absorption may affect electrolyte balance and impair kidney function. Dehydration, weight loss, skin effects, and thyroid disturbances have been reported.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Firefighting Measures

General Information: During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated. Non-combustible, substance itself does not burn but may decompose upon heating to produce irritating, corrosive and/or toxic fumes.

Extinguishing Media: Do NOT get water inside containers. For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Cool containers with flooding quantities of water until well after fire is out.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Wash hands before eating. Use with adequate ventilation. Minimize dust generation and accumulation. Do not get in eyes, on skin, or on clothing. Do not get on skin or in eyes. Discard contaminated shoes.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
LITHIUM HYDROXIDE	none listed	none listed	none listed

OSHA Vacated PELs: LITHIUM HYDROXIDE: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: colorless to white

Odor: None reported

pH: 14 (1N sol.)

Vapor Pressure: Negligible.

Vapor Density: Not available.

Evaporation Rate: Negligible.

Viscosity: Not available.

Boiling Point: 1695 deg F

Freezing/Melting Point: 842 deg F

Decomposition Temperature: 1695 deg F

Autoignition Temperature: Not available.

Flash Point: Not available.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Reactivity: 0

Explosion Limits, Lower: Not available.

Upper: Not available.

Solubility: Soluble in water.

Specific Gravity/Density: 2.5 (water=1)

Molecular Formula: LiOH

Molecular Weight: 23.9474

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions. May decompose on exposure to moist air or water.

Conditions to Avoid: Incompatible materials, dust generation, moisture, excess heat.

Incompatibilities with Other Materials: Strong acids and strong oxidizing agents.

Hazardous Decomposition Products: Irritating and toxic fumes and gases, oxides of lithium.

Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:

CAS# 1310-65-2: OJ6307070

LD50/LC50:

CAS# 1310-65-2:

Inhalation, rat: LC50 = 960 mg/m³/4H;

Carcinogenicity:

CAS# 1310-65-2: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: Please refer to RTECS for specific information.

Other Studies: See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Not available.

Environmental Fate: Not available.

Physical/Chemical: Not available.

Other: Not available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	LITHIUM HYDROXIDE, SOLID				LITHIUM HYDROXIDE
Hazard Class:	8				8
UN Number:	UN2680				UN2680
Packing Group:	II				II

Section 15 - Regulatory Information

TSCA

CAS# 1310-65-2 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA**Section 302 (RQ)**

None of the chemicals in this material have an RQ.

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1310-65-2: acute, chronic.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1310-65-2 can be found on the following state right to know lists: Minnesota. California No Significant Risk Level; None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

C

Risk Phrases:

R 35 Causes severe burns.

Safety Phrases:

S 2 Keep out of reach of children. S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)

CAS# 1310-65-2: No information available.

Canada

CAS# 1310-65-2 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of D1B, E.

CAS# 1310-65-2 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 1310-65-2: OEL-UNITED KINGDOM:STEL 1 mg/m3

Section 16 - Additional Information

MSDS Creation Date: 9/02/1997

Revision #3 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

Material Safety Data Sheet

Hydrogen Peroxide 30-50%

ACC# 11189

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrogen Peroxide 30-50%**Catalog Numbers:** AC9470941, S74876, S74876-1, S748761, S74879, S74882, H323-500, H323500, H325 100, H325 4, H325 500, H325-100, H325-4, H325-500, H325100, H3254, H325500, H325500001, H327 500, H327-500, H327500, H327500LC, H341 500, H341-500, H341500, S748761MF, WESH325500, ZZH3253015**Synonyms:** Carbamide Peroxide; Hydrogen Dioxide; Peroxide; Hydroperoxide; Urea Peroxide; Hydrogen Peroxide 100 Volumes.**Company Identification:**Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
7722-84-1	Hydrogen peroxide	30-50	231-765-0
7732-18-5	Water	Balance	231-791-2

Hazard Symbols: O C**Risk Phrases:** 34 8

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless. **Danger!** Strong oxidizer. Contact with other material may cause a fire. Corrosive. Material is light sensitive. Mutagen. May be harmful if swallowed. May cause central nervous system effects. Eye contact may result in permanent eye damage. May cause blood abnormalities. May cause severe respiratory tract irritation with possible burns. Causes eye and skin irritation and possible burns. May cause severe digestive tract irritation with possible burns.

Target Organs: Blood, central nervous system.**Potential Health Effects****Eye:** Contact with liquid is corrosive to the eyes and causes severe burns. Contact with the eyes may cause corneal damage.**Skin:** Causes severe skin irritation and possible burns. May cause discoloration, erythema, swelling, and the formation of papules and vesicles.

Ingestion: Causes gastrointestinal irritation with nausea, vomiting and diarrhea. Causes gastrointestinal tract burns. May cause vascular collapse and damage. May cause damage to the red blood cells. May cause difficulty in swallowing, stomach distension, possible cerebral swelling and death. Ingestion may result in irritation of the esophagus, bleeding of the stomach and ulcer formation.

Inhalation: Causes chemical burns to the respiratory tract. May cause ulceration of nasal tissue, insomnia, nervous tremors with numb extremities, chemical pneumonia, unconsciousness, and death. At high concentrations, respiratory effects may include acute lung damage and delayed pulmonary edema.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Laboratory experiments have resulted in mutagenic effects. Repeated contact may cause corneal damage.

Section 4 - First Aid Measures

Eyes: Get medical aid immediately. Do NOT allow victim to rub or keep eyes closed. Extensive irrigation is required (at least 30 minutes).

Skin: Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. Wash mouth out with water. Vomiting may occur spontaneously. If vomiting occurs and the victim is conscious, give water to further dilute the chemical.

Inhalation: Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. DO NOT use mouth-to-mouth respiration. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively. Attempts at evacuating the stomach via emesis induction or gastric lavage should be avoided. In the event of severe distension of the stomach or esophagus due to gas formation, insertion of a gastric tube may be required. To treat corneal damage, careful ophthalmologic evaluation is recommended and the possibility of local corticosteroid therapy should be considered.

Section 5 - Firefighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Strong oxidizer. Contact with combustible materials may cause a fire. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Use water spray to keep fire-exposed containers cool. Substance is noncombustible. Use water with caution and in flooding amounts. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. Some oxidizers may react explosively with hydrocarbons(fuel). May decompose explosively when heated or involved in a fire. May accelerate burning if involved in a fire.

Extinguishing Media: Use water only! Do NOT use carbon dioxide. Do NOT use dry chemical. Do NOT get water inside containers. Contact professional fire-fighters immediately. Cool containers with flooding quantities of water until well after fire is out. For large fires, flood fire area with large quantities of water, while knocking down vapors with water fog.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Flush spill area with water. Provide ventilation. Do not get water inside containers. Keep combustibles (wood, paper, oil, etc.,) away from spilled material.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use only in a well-ventilated area. Contents may develop pressure upon prolonged storage. Do not get in eyes, on skin, or on clothing. Keep container tightly closed. Avoid contact with clothing and other combustible materials. Do not ingest or inhale. Store protected from light. Discard contaminated shoes. Unused chemicals should not be returned to the container. Rinse empty drums and containers thoroughly with water before discarding.

Storage: Keep away from heat, sparks, and flame. Do not store near combustible materials. Keep container closed when not in use. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from light. Keep away from alkalies, oxidizable materials, finely divided metals, alcohols, and permanganates. Store below 35°C. Store only in light-resistant containers fitted with a safety vent.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Hydrogen peroxide	1 ppm	1 ppm TWA; 1.4 mg/m ³ TWA 75 ppm IDLH	1 ppm TWA; 1.4 mg/m ³ TWA
Water	none listed	none listed	none listed

OSHA Vacated PELs: Hydrogen peroxide: 1 ppm TWA; 1.4 mg/m³ TWA Water: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR §1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear, colorless
Odor: slight acid odor
pH: 3.3 (30% solution)
Vapor Pressure: 23 mm Hg @ 30C
Vapor Density: 1.10
Evaporation Rate: >1.0 (Butyl acetate=1)
Viscosity: 1.25 cP
Boiling Point: 108 deg C @ 760 mmHg
Freezing/Melting Point: -33 deg C
Decomposition Temperature: Not available.
Autoignition Temperature: Noncombustible
Flash Point: Noncombustible
NFPA Rating: Not published.
Explosion Limits, Lower: 40 vol %
Upper: 100 vol %
Solubility: Miscible in water.
Specific Gravity/Density: 1.1-1.2 (30-50%)
Molecular Formula: H₂O₂
Molecular Weight: 34.0128

Section 10 - Stability and Reactivity

Chemical Stability: Decomposes slowly to release oxygen. Unstable when heated or contaminated with heavy metals, reducing agents, rust, dirt or organic materials. Stability is reduced when pH is above 4.0.

Conditions to Avoid: Mechanical shock, incompatible materials, light, ignition sources, dust generation, excess heat, combustible materials, reducing agents, alkaline materials, strong oxidants, rust, dust, pH > 4.0.

Incompatibilities with Other Materials: Activated carbon, tert-butyl alcohol, chlorosulfonic acid, cyclopentadiene, charcoal, formic acid, magnesium, hydrazine, hydrogen selenide, manganese dioxide, mercurous chloride, strong oxidizing agents, strong reducing agents, brass, copper, copper alloys, galvanized iron, nickel, lead, rust, ethers (e.g. dioxane, furfuran, tetrahydrofuran (THF)), carboxylic acids, alcohols, aniline, glycerine, sodium borate, urea, sodium carbonate, triethylamine, sodium fluoride, sodium pyrophosphate, soluble fuels (acetone, ethanol, glycerol), acetic acid, acetic anhydride, nitrogen compounds, wood, wood, alkalies, asbestos, organic matter, finely powdered metals, iron, silver, platinum, palladium, ketones, cyanides (e.g. potassium cyanide, sodium cyanide), hexavalent chromium compounds, nitric acid, potassium permanganate, salts of iron, copper, chromium, vanadium, tungsten, molybdenum, and platinum.

Hazardous Decomposition Products: Oxygen, hydrogen gas, water, heat, steam.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 7722-84-1: MX0899000 MX0900000

CAS# 7732-18-5: ZC0110000

LD50/LC50:

CAS# 7722-84-1:

Inhalation, rat: LC50 = 2 gm/m³/4H;

Oral, mouse: LD50 = 2 gm/kg;

Skin, rat: LD50 = 4060 mg/kg;

CAS# 7732-18-5:

Oral, rat: LD50 = >90 mL/kg;

Carcinogenicity:

CAS# 7722-84-1:

ACGIH: A3 - Animal Carcinogen**IARC:** Group 3 carcinogen CAS# 7732-18-5: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.**Epidemiology:** No information available.**Teratogenicity:** No information available.**Reproductive Effects:** No information available.**Neurotoxicity:** No information available.**Mutagenicity:** CAS#: 7722-84-1 Mutation in Microorganisms: Salmonella typhimurium = 100

ug/plate.; Hyman, embryo = 50 umol/L.; Cytogenetic Analysis: Human, embryo = 20 umol/L.

Mutation in Mammalian Somatic Cells: Hamster, lung = 1mmol/L.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Not available.

Environmental Fate: Rain washout is expected due to condensation of hydrogen peroxide on contact with water droplets. In the atmosphere, indirect photooxidation is predicted with a half-life of 10 to 20 hours. Non-significant evaporation and adsorption from water surfaces and soil/sediments is expected. Rapid and considerable aerobic biodegradation was determined with a half-life < 1 minute (biological treatment sludge) and 0.3 to 2 days (fresh water). Hydrogen peroxide is non-bioaccumulable.

Physical/Chemical: Not available.**Other:** Not available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.**RCRA U-Series:** None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS 30%				HYDROGEN PEROXIDE
Hazard Class:	5.1				5.1(8)
UN Number:	UN2014				UN2014
Packing Group:	II				II

Section 15 - Regulatory Information

US FEDERAL**TSCA**

CAS# 7722-84-1 is listed on the TSCA inventory.

CAS# 7732-18-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA**Section 302 (RQ)**

None of the chemicals in this material have an RQ.

Section 302 (TPQ)

CAS# 7722-84-1: concentration > 52%: TPQ = 1000 pounds; RQ = 1000 pounds

SARA Codes

CAS # 7722-84-1: acute, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

CAS# 7722-84-1 is considered highly hazardous by OSHA.

STATE

CAS# 7722-84-1 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

CAS# 7732-18-5 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

O C

Risk Phrases:

R 34 Causes burns. R 8 Contact with combustible material may cause fire.

Safety Phrases:

S 28 After contact with skin, wash immediately with plenty of soap and water. S 3 Keep in a cool place. S 36/39 Wear suitable protective clothing and eye/face protection. S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7722-84-1: 0

CAS# 7732-18-5: No information available.

Canada

CAS# 7722-84-1 is listed on Canada's DSL/NDSL List.

CAS# 7732-18-5 is listed on Canada's DSL/NDSL List.

This product has a WHMIS classification of C, E, D2A.

CAS# 7722-84-1 is not listed on Canada's Ingredient Disclosure List.

CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 7722-84-1: OEL-AUSTRALIA:TWA 1 ppm (1.5 mg/m³) OEL-BELGIUM:TWA 1 ppm (1.4 mg/m³) OEL-DENMARK:TWA 1 ppm (1.4 mg/m³) OEL-FINLAND:TWA 1 ppm (1.4 mg/m³);STEL 3 ppm (4.2 mg/m³) OEL-FRANCE:TWA 1 ppm (1.5 mg/m³) OEL-GERMANY:TWA 1 ppm (1.4 mg/m³) OEL-THE NETHERLANDS:TWA 1 ppm (1.4 mg/m³) OEL-THE PHILIPPINES:TWA 1 ppm (1.4 mg/m³) OEL-SWITZERLAND:TWA 1 ppm (1.4 mg/m³);STEL 2 ppm (2.8 mg/m³) OEL-TURKEY:TWA 1 ppm (1.4 mg/m³) OEL-UNITED KINGDOM:TWA 1 ppm (1.5 mg/m³);STEL 2 ppm (3 mg/m³)

Section 16 - Additional Information
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MSDS Creation Date: 4/21/1999

Revision #3 Date: 8/02/2000

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.



Material Safety Data Sheet

Zinc Acetate Dihydrate

ACC# 25250

Section 1 - Chemical Product and Company Identification

MSDS Name: Zinc Acetate Dihydrate**Catalog Numbers:** A4321304, A4928753, A4928755, Z0080, Z20 500**Synonyms:** Acetic acid; Zinc salt; Zinc acetate**Company Identification:**

Fisher Scientific
1 Reagent Lane
Fairlawn, NJ 07410

For information, call: 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
5970-45-6	Zinc Acetate Dihydrate	100	unlisted

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white. **Caution!** May cause respiratory tract irritation. May be harmful if swallowed. May cause severe eye and skin irritation with possible burns. May cause digestive tract irritation with nausea, vomiting, and diarrhea.

Target Organs: None.

Potential Health Effects

Eye: Contact with eyes may cause severe irritation, and possible eye burns.

Skin: Contact with skin causes irritation and possible burns, especially if the skin is wet or moist.

Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May be harmful if swallowed.

Inhalation: Inhalation of fumes may cause metal fume fever, which is characterized by flu-like symptoms with metallic taste, fever, chills, cough, weakness, chest pain, muscle pain and increased white blood cell count. May cause respiratory tract irritation.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Get medical aid immediately.

Skin: Get medical aid. Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid.

Inhalation: Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Firefighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

Extinguishing Media: In case of fire use water spray, dry chemical, carbon dioxide, or chemical foam.

Autoignition Temperature: Not applicable.

Flash Point: Not applicable. (estimated) Health: ; Flammability: ; Reactivity: Explosion Limits, Lower: Not available. Upper: Not available.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Flush spill area with water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Avoid contact with skin and eyes. Avoid ingestion and inhalation. Discard contaminated shoes.

Storage: Store in a cool, dry place. Keep containers tightly closed.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Zinc Acetate Dihydrate	none listed	none listed	none listed

OSHA Vacated PELs: Zinc Acetate Dihydrate: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR '1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white

Odor: faint vinegar like odor

pH: Neutral to acidic.

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate:

Viscosity: Not available.

Boiling Point: Not available.

Freezing/Melting Point: 237 deg C

Decomposition Temperature: 100 deg C

Solubility: Very soluble in water.

Specific Gravity/Density: 1.735

Molecular Formula: $\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}$

Molecular Weight:

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials.

Incompatibilities with Other Materials: Zinc salts, alkalies and their carbonates, oxalates, phosphates, sulfides.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, toxic fumes of zinc oxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 5970-45-6: ZG8750000

LD50/LC50:

CAS# 5970-45-6:

Oral, mouse: LD50 = 287 mg/kg;

Oral, rat: LD50 = 794 mg/kg;

Carcinogenicity:

CAS# 5970-45-6: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: No data available.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: Mutagenicity data exists for human lymphocyte cells at a dose of 7 mg/L.

Other Studies: No data available.

Section 12 - Ecological Information

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

RCRA D-Series Maximum Concentration of Contaminants: None listed.

RCRA D-Series Chronic Toxicity Reference Levels: None listed.

RCRA F-Series: None listed.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	No information available.	No information available.	No information available.	No information available.	No information available.
Hazard Class:					
UN Number:					
Packing Group:					

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 5970-45-6 is not on the TSCA Inventory. It is a hydrate and exempt from TSCA Inventory requirements (40CFR720.3(u)(2)).

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

None of the chemicals in this material have an RQ.

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 5970-45-6: acute.

Section 313

This material contains Zinc Acetate Dihydrate (listed as ZINC), 100%, (CAS# 5970-45-6) which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 5970-45-6 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

Not available.

Risk Phrases:**Safety Phrases:****WGK (Water Danger/Protection)**

CAS# 5970-45-6: No information available.

Canada

None of the chemicals in this product are listed on the DSL/NDL list. This product has a WHMIS classification of D2B.

CAS# 5970-45-6 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 5970-45-6 (listed as zinc): OEL-ARAB Republic of Egypt:TWA 0.1 mg/m³

Section 16 - Additional Information
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MSDS Creation Date: 4/21/1995

Revision #8 Date: 12/12/1997

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

AGA GAS, INC. (216) 642-6600
6055 ROCKSIDE WOODS BLVD.
P.O. BOX 94737
CLEVELAND, OH 44101-4737

MATERIAL
SAFETY
DATA SHEET

69009165-1

NO. 34

PRODUCT NAME • Hydrogen	CAS # 1333-74-0
TRADE NAME AND SYNONYMS Hydrogen, compressed (D.O.T.); Water Gas	DOT I.D. No.: UN 1049
CHEMICAL NAME AND SYNONYMS Hydrogen; Normal Hydrogen	DOT Hazard Class: Division 2.1
ISSUE DATE AND REVISIONS Revised Dec. 1998	Formula: H ₂
	Chemical Family: Inorganic Flammable Gas

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT Hydrogen is defined as a simple asphyxiant (ACGIH 1994-1995); OSHA 1993 PEL (8 Hr. TWA)= No Listing. (Continued on Page 4)
SYMPTOMS OF EXPOSURE <u>Inhalation:</u> High concentrations of hydrogen so as to exclude an adequate supply of oxygen to the lungs causes dizziness, deeper breathing due to air hunger, possible nausea and eventual unconsciousness.
TOXICOLOGICAL PROPERTIES Hydrogen is inactive biologically and essentially nontoxic; therefore, the major property is the exclusion of an adequate supply of oxygen to the lungs. Hydrogen is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen. Persons in ill health where such illness would be aggravated by exposure to hydrogen should not be allowed to work with or handle this product.
RECOMMENDED FIRST AID TREATMENT PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO HYDROGEN. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD. <u>Inhalation:</u> Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.
Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

Hydrogen

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Hydrogen is flammable over a very wide range in air.

PHYSICAL DATA

BOILING POINT -423°F (-252.8°C)	LIQUID DENSITY AT BOILING POINT 4.43 lb/ft ³ (70.96 kg/m ³)
VAPOR PRESSURE @ 70°F (21.1°C) = Above the critical temperature of -399.8°F (-239.9°C)	GAS DENSITY AT 70°F, 1 atm .0052
SOLUBILITY IN WATER Very slightly	FREEZING POINT -434.6°F (-259.2°C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = .069
APPEARANCE AND ODOR Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A (Gas)	AUTO IGNITION TEMPERATURE 1058°F (570°C)	FLAMMABLE LIMITS % BY VOLUME LEL 4 UEL 74.5
EXTINGUISHING MEDIA Water, carbon dioxide, dry chemical		ELECTRICAL CLASSIFICATION Class 1, Group B
SPECIAL FIRE FIGHTING PROCEDURES If possible, stop the flow of hydrogen. Cool surrounding containers with water spray. Hydrogen burns with an almost invisible flame of relatively low thermal radiation.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Hydrogen is very light and rises very rapidly in air. Should a hydrogen fire be extinguished and the flow of gas continue, increase ventilation to prevent an explosion hazard, particularly in the upper portions (Continued on Page 4)		

REACTIVITY DATA

STABILITY Unstable		CONDITIONS TO AVOID
Stable	X	None
INCOMPATIBILITY (Materials to avoid) Oxidizers		
HAZARDOUS DECOMPOSITION PRODUCTS None		
HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur		None
Will Not Occur	X	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.
WASTE DISPOSAL METHOD Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

RESPIRATORY PROTECTION (Specify type)			Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.
VENTILATION	LOCAL EXHAUST	SPECIAL	N/A
	MECHANICAL (Gen.)	OTHER	N/A
Hood with forced ventilation		In accordance with electrical codes	
PROTECTIVE GLOVES		Plastic or rubber	
EYE PROTECTION		Safety goggles or glasses	
OTHER PROTECTIVE EQUIPMENT		Safety shoes, safety shower	

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION	
DOT Shipping Name: Hydrogen, compressed	DOT Hazard Class: Division 2.1
DOT Shipping Label: Flammable Gas	I.D. No.: UN 1049
SPECIAL HANDLING RECOMMENDATIONS	
<p>Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3,000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.</p> <p>For additional handling recommendations, consult Compressed Gas Association's Pamphlets G-5, P-1, P-14, and Safety Bulletin SB-2.</p>	
SPECIAL STORAGE RECOMMENDATIONS	
<p>Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125F (52C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.</p> <p>For additional storage recommendations, consult Compressed Gas Association's Pamphlets G-5, P-1, P-14, and Safety Bulletin SB-2.</p>	
SPECIAL PACKAGING RECOMMENDATIONS	
<p>Hydrogen is noncorrosive and may be used with any common structural material.</p>	
OTHER RECOMMENDATIONS OR PRECAUTIONS	
<p>Earth-ground and bond all lines and equipment associated with the hydrogen system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).</p>	

(Continued on Page 4)

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this

Hydrogen

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT: (Continued)

Oxygen levels should be maintained at greater than 18 Molar percent at normal atmospheric pressure ($pO_2 > 135$ torr).

FIRE AND EXPLOSION HAZARD DATA

UNUSUAL FIRE AND EXPLOSION HAZARDS: (Continued)

of buildings or sheds where the gas might "collect."

SPECIAL PRECAUTIONS

OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

Reporting under SARA, Title III, Section 313 not required.

NFPA 704 NO. for hydrogen = 1 4 0 None

MSDS

Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

MALLINCKRODT



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response In Canada
CANUTEC: 613-696-6566

Outside U.S. and Canada
Chemtrec: 202-493-7616

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

POTASSIUM CHROMATE

MSDS Number: P5642 — Effective Date: 03/03/99

1. Product Identification

Synonyms: Chromic acid, dipotassium salt; dipotassium chromate; bipotassium chromate

CAS No.: 7789-00-6

Molecular Weight: 194.19

Chemical Formula: K₂CrO₄

Product Codes:

J.T. Baker: 3058

Mallinckrodt: 6870

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Potassium Chromate	7789-00-6	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE A FIRE. CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. MAY CAUSE ALLERGIC REACTION. CANCER HAZARD. CAN CAUSE CANCER.
Risk of cancer depends on duration and level of exposure.

Health Rating: 4 - Extreme (Cancer Causing)

Flammability Rating: 0 - None

Reactivity Rating: 3 - Severe (Oxidizer)

Contact Rating: 3 - Severe (Life)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;
PROPER GLOVES

Storage Color Code: Yellow (Reactive)

Potential Health Effects

Inhalation:

Corrosive. Extremely destructive to tissues of the mucous membranes and upper respiratory tract. May cause ulceration and perforation of the nasal septum. Symptoms may include sore throat, coughing, shortness of breath, and labored breathing. May produce pulmonary sensitization or allergic asthma. Higher exposures may cause pulmonary edema.

Ingestion:

Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. May cause violent gastroenteritis, peripheral vascular collapse, dizziness, intense thirst, muscle cramps, shock, coma, abnormal bleeding, fever, liver damage and acute renal failure.

Skin Contact:

Corrosive. Symptoms of redness, pain, and severe burn can occur. Dusts and strong solutions may cause severe irritation. Contact with broken skin may cause ulcers (chrome sores) and absorption, which may cause systemic poisoning, affecting kidney and liver functions. May cause skin sensitization.

Eye Contact:

Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. May cause corneal injury or blindness.

Chronic Exposure:

Repeated or prolonged exposure can cause ulceration and perforation of the nasal septum, respiratory irritation, liver and kidney damage and ulceration of the skin. Ulcerations at first may be painless, but may penetrate to the bone producing "chrome holes." Known to be a human carcinogen.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, asthma, allergies or known sensitization to chromic acid or chromates may be more susceptible to the effects of this material.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

5. Fire Fighting Measures

Fire:

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Releases oxygen, upon decomposition, which enhances combustion.

Explosion:

Contact with oxidizable substances may cause extremely violent combustion. Becomes a possible explosion hazard when shocked, heated, or exposed to hydrazine.

Fire Extinguishing Media:

Flood with large amounts of water. Water spray may be used to keep fire exposed containers cool. Do not allow water runoff to enter sewers or waterways.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Do not store on wooden floors. Wear special protective equipment (Sec. 8) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

- OSHA Permissible Exposure Limit (PEL):

For chromic acid and chromates, as $\text{CrO}_3 = 0.1 \text{ mg/m}^3$ (ceiling)

09004570-4
- ACGIH Threshold Limit Value (TLV):

For water-soluble Cr(VI) compounds, as Cr = 0.05 mg/m³ (TWA), A1 - confirmed human carcinogen.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator.

WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Yellow crystals.

Odor:

Odorless.

Solubility:

69.9g/100 g water @ 20C (68F).

Density:

2.73

pH:

Aqueous soln. is alkaline to litmus.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

No information found.

Melting Point:

975C (1787F)

Vapor Density (Air=1):

6.7

Vapor Pressure (mm Hg):

Zero.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Burning may produce chrome oxides.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Reducing agents, hydrazine, and flammable materials. Any combustible, organic or other readily oxidizable material (paper, wood, sulfur, aluminum or plastics).

Conditions to Avoid:

Heat, incompatibles.

11. Toxicological Information

Oral rat LD50: 180 mg/kg. Investigated as a tumorigen, mutagen, reproductive effector.

-----\Cancer Lists\-----			
Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Potassium Chromate (7789-00-6)	Yes	No	1

12. Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into water, this material is not expected to evaporate significantly. This material may bioaccumulate to some extent. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.

Environmental Toxicity:

This material is expected to be toxic to aquatic life. The EC50/48-hour values for daphnia are less than 1 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: OXIDIZING SOLID, CORROSIVE, N.O.S. (POTASSIUM CHROMATE)
Hazard Class: 5.1, 8
UN/NA: UN3085
Packing Group: III
Information reported for product/size: 375LB

International (Water, I.M.O.)

Proper Shipping Name: OXIDIZING SOLID, CORROSIVE, N.O.S. (POTASSIUM CHROMATE)
Hazard Class: 5.1, 8
UN/NA: UN3085
Packing Group: III
Information reported for product/size: 375LB

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----
Ingredient TSCA EC Japan Australia

Potassium Chromate (7789-00-6) Yes Yes Yes Yes

-----\Chemical Inventory Status - Part 2\-----
Ingredient Korea DSL NDSL Phil.

Potassium Chromate (7789-00-6) Yes Yes No Yes

-----\Federal, State & International Regulations - Part 1\-----
Ingredient -SARA 302- -SARA 313-
RQ TPQ List Chemical Catg.

Potassium Chromate (7789-00-6) No No No Chromium com

-----\Federal, State & International Regulations - Part 2\-----
Ingredient CERCLA -RCRA- -TSCA-
261.33 8(d)

Potassium Chromate (7789-00-6) 10 No No

Chemical Weapons Convention: No TSCA 12(b): Yes CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: Yes (Pure / Solid)

WARNING:

THIS PRODUCT CONTAINS A CHEMICAL(S) KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER.

Australian Hazchem Code: None allocated.

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 1 Other: Oxidizer

Label Hazard Warning:

DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE A FIRE. CORROSIVE. CAUSES SEVERE BURNS TO EVERY AREA OF CONTACT. HARMFUL IF SWALLOWED OR INHALED. AFFECTS THE RESPIRATORY SYSTEM, LIVER, KIDNEYS, EYES, SKIN AND BLOOD. MAY CAUSE ALLERGIC REACTION. CANCER HAZARD. CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

Label Precautions:

- Keep from contact with clothing and other combustible materials.
- Do not get in eyes, on skin, or on clothing.
- Do not breathe dust or mist from solutions.
- Keep container closed.
- Use only with adequate ventilation.
- Wash thoroughly after handling.
- Store in a tightly closed container.
- Do not store near combustible materials.

Label First Aid:

In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3, 11, 14.

Disclaimer:

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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

MATERIAL SAFETY DATA SHEET

Sodium Bicarbonate



MSDS Ref. No: 144-55-8
Version: US/Canada
Date Approved: 06/05/2002
Revision No: 2

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Sodium Bicarbonate
SYNONYM(s): Baking Soda, Bicarbonate of Soda
GENERAL USE: Leavening agent, cleaner ingredient, bath salt ingredient, water softener, diaper rinse ingredient, feed additive.

This chemical is certified to ANSI/NSF Standard 60, Drinking Water Chemicals-Health Effects. The maximum dosage level for this chemical is 100 mg/L.

MANUFACTURER

FMC Wyoming Corporation
Alkali Chemicals Division
1735 Market Street
Philadelphia, PA 19103
General Information: 215-299-6000

Emergency Telephone Numbers:

CHEMTREC (U.S.): (800) 424-9300
Emergency Phone (303) 595-9048
(Medical - call collect)
Emergency Phone (307) 875-2580
(Green River, WY-call collect)

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Chemical Name</u>	<u>CAS#</u>	<u>Wt. %</u>
Sodium Bicarbonate	144-55-8	100

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

IMMEDIATE CONCERNS: White, granular solid. Product is non-combustible.
Reacts with acids to release carbon dioxide gas and heat.

POTENTIAL HEALTH EFFECTS: No significant health effects anticipated.

4. FIRST AID MEASURES

EYES: Flush with plenty of water. Get medical attention if irritation occurs and persists.

SKIN: Wash with plenty of soap and water. Get medical attention if irritation occurs and persists.

INGESTION: Drink plenty of water. Never give anything by mouth to an unconscious person. If any discomfort persists, obtain medical attention.

INHALATION: Remove to fresh air. If breathing difficulty or discomfort occurs and persists, obtain medical attention.

NOTES TO MEDICAL DOCTOR: Internal toxicity is low. Treatment is symptomatic and supportive.

5. FIRE FIGHTING MEASURES

FLASH POINT AND METHOD: Non-combustible

FLAMMABLE LIMITS: Not applicable

AUTOIGNITION TEMPERATURE: Not applicable

EXTINGUISHING MEDIA: Water, water fog, carbon dioxide (CO₂), dry chemical

HAZARDOUS COMBUSTION PRODUCTS: None

FIRE / EXPLOSION HAZARDS: None

FIRE FIGHTING PROCEDURES: None

SENSITIVITY TO STATIC DISCHARGE: None

SENSITIVITY TO IMPACT: None

HAZARDOUS DECOMPOSITION PRODUCTS: None

6. ACCIDENTAL RELEASE MEASURES

05010170-3

GENERAL PROCEDURES: Sweep up as much as possible for salvage or disposal. Wash away residue with water.

7. HANDLING AND STORAGE

HANDLING: Use air conveying/mechanical systems for bulk transfer to storage. For manual handling of bulk transfer use mechanical ventilation to remove airborne dust from railcar, ship or truck. Use approved respiratory protection when ventilation systems are not available. Selection of respirators is based on the dust cloud generated.

STORAGE: Store in a cool dry area, away from acids.

COMMENTS: Use general room dilution or local exhaust ventilation when excessive dust is expected in the work environment.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Minimize eye and skin contact by using appropriate protective equipment. Use local or general room ventilation to control airborne dust that may be generated into the work environment.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Chemical goggles

RESPIRATORY: Wear MSHA-NIOSH approved dust respirator or dust mask if visible dust levels are experienced or anticipated.

PROTECTIVE CLOTHING: General purpose gloves. Full cover clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Odorless

APPEARANCE: White, granular solid.

pH: (1% solution): 8.3

PERCENT VOLATILE: Not available

VAPOR PRESSURE: Not available

VAPOR DENSITY: (Air = 1): Not applicable

BOILING POINT: Not applicable

MELTING POINT: Decomposes

SOLUBILITY IN WATER: % by wt. @ 20°C (68°F): 9.0

EVAPORATION RATE: (Butyl Acetate = 1) Not applicable

DENSITY: 0.88 g/mL

SPECIFIC GRAVITY: (H₂O = 1) 2.20

COEFF. OIL/WATER: Not available

ODOR THRESHOLD: Not applicable

OXIDIZING PROPERTIES: Not applicable

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Contact with acids except under controlled conditions.

STABILITY: Stable

POLYMERIZATION: Will not occur

HAZARDOUS DECOMPOSITION PRODUCTS: None

INCOMPATIBLE MATERIALS: Reacts with acids to release carbon dioxide gas and heat.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: Non-irritating (rabbit) J. Amer. Coll. Toxicol. 1987

SKIN EFFECTS: Non-irritating (rabbit) J. Amer. Coll. Toxicol. 1987

DERMAL LD₅₀: No data available for the product.

ORAL LD₅₀: 4300 mg/kg (rat) (20% slurry)

6000 mg/kg (rat) (50% slurry)
Gosselin, Smith & Hodge, Clinical Tox. of Comm. Products, 1984

INHALATION LC₅₀: No data available for the product.

TARGET ORGANS: None

ACUTE EFFECTS FROM OVEREXPOSURE: Sodium bicarbonate is a GRAS (Generally Recognized As Safe) food ingredient. No significant toxicity is expected.

CHRONIC EFFECTS FROM OVEREXPOSURE: Administration of large doses of sodium bicarbonate to patients with renal insufficiency can produce systemic alkalosis.

CARCINOGENICITY:

IARC: Not listed

NTP: Not listed

OSHA: Not listed

OTHER: (ACGIH) Not listed

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION: 48 hr LC₅₀ = 2000 mg/L (Culex sp. larvae or mosquito)

CHEMICAL FATE INFORMATION: No data available for the product.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: If material cannot be salvaged, an acceptable method is to dispose of uncontaminated product into a secured landfill in accordance with all local, state and federal environmental regulations. Empty containers may be incinerated or discarded as general trash.

14. TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT)

PROPER SHIPPING NAME: Not regulated

PRIMARY HAZARD CLASS/DIVISION: Not applicable

UN/NA NUMBER: None

PLACARDS: Not applicable

LABEL: Not applicable

OTHER SHIPPING INFORMATION:

DOT Marking: Not applicable

Hazardous Substance/RQ: Not applicable

49 STCC Number: Not applicable

SPECIAL SHIPPING NOTES: IMDG: Not regulated

LATA: Not regulated

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS
SUBSTANCES (40 CFR 355):** Not listed

SECTION 311 HAZARD CATEGORY (40 CFR 370): Not applicable

SECTION 313 REPORTABLE INGREDIENTS (40 CFR 372): Not listed

CERCLA (COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT)

CERCLA REGULATORY (40 CFR 302.4): Not applicable

TSCA (TOXIC SUBSTANCE CONTROL ACT)

TSCA STATUS (40 CFR 710): Listed

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM): Product Identification No.: None
Hazard Classification: None
Ingredient Disclosure List: Not listed

16. OTHER INFORMATION

REVISION SUMMARY

This MSDS replaces Revision #1 dated August 18, 2000. Changes in information are as follows:

Section 16 (Other Information): HMIS Headings

HMIS RATING

HEALTH:	0
FLAMMABILITY	0
PHYSICAL HAZARD:	0
PERSONAL PROTECTION (PPE):	E

NFPA RATING

HEALTH:	0
FLAMMABILITY	0
REACTIVITY:	0
SPECIAL:	None

Key

4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

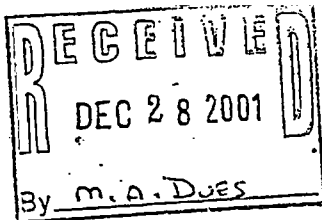
HMIS RATINGS NOTES:

Protection = E (Safety glasses, gloves, dust respirator)

The contents and format of this MSDS are in accordance with OSHA Hazard Communication Standard and Canada's Workplace Hazardous Information System (WHMIS).

National Fire Protection Association (NFPA)

Hazardous Materials Identification System (HMIS)



69004382-1

Material Safety Data Sheet

Potassium Hydroxide

ACC# 19431

Section 1 - Chemical Product and Company Identification

MSDS Name: Potassium Hydroxide**Catalog Numbers:** S71978, S71979, S71979-1, S71979-2, NC9621916, NC9682143, P246 3, P246-3, P2463, P250 1, P250 10, P250 3, P250 50, P250 500, P250-1, P250-10, P250-3, P250-50, P250-500, P2501, P25010, P2503, P25050, P250500, P25050LC, P251 3, P251 500, P251-1, P251-10, P251-3, P251-50, P251-500, P2513, P251500, P25150KG, PFP25050LC, S71977, S72221D, WESP250500, XXP246100LB, XXP251EP50KG1**Synonyms:** Caustic potash, Lye, Potassium hydrate**Company Identification:**Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887**RECEIVED**
JAN 03 2002

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
1310-58-3	Potassium hydroxide (KOH)	100.0	215-181-3

Hazard Symbols: C**Risk Phrases:** 22 35

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: white or yellow. **Danger!** Corrosive. Water-Reactive. Harmful if swallowed. Causes severe eye and skin burns. Causes severe digestive and respiratory tract burns.**Target Organs:** None.**Potential Health Effects****Eye:** Causes severe eye burns. May cause irreversible eye injury. Contact may cause ulceration of the conjunctiva and cornea. Eye damage may be delayed.**Skin:** Causes skin burns. May cause deep, penetrating ulcers of the skin.**Ingestion:** Harmful if swallowed. May cause circulatory system failure. May cause perforation of the digestive tract. Causes severe digestive tract burns with abdominal pain, vomiting, and possible death.**Inhalation:** Harmful if inhaled. Irritation may lead to chemical pneumonitis and pulmonary edema. Causes severe irritation of upper respiratory tract with coughing, burns, breathing

difficulty, and possible coma.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Get medical aid immediately. Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure.

Ingestion: Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.

Inhalation: Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Treat symptomatically and supportively.

Section 5 - Firefighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water with caution and in flooding amounts. Contact with moisture or water may generate sufficient heat to ignite nearby combustible materials.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam.

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Avoid generating dusty conditions.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Use with adequate ventilation. Do not allow water to get into the container because of violent reaction. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Keep away from strong acids. Keep away from water. Keep away from metals. Keep away from flammable liquids. Keep away from organic halogens.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Potassium hydroxide (KOH)	C 2 mg/m ³	2 mg/m ³ TWA	none listed

OSHA Vacated PELs: Potassium hydroxide (KOH): No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear safety glasses and chemical goggles or face shield if handling liquids.

Skin: Wear appropriate gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29CFR 1910.134 or European Standard EN 149. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Section 9 - Physical and Chemical Properties

Physical State: Solid

Appearance: white or yellow

Odor: odorless

pH: 13.5 (0.1M solution)

Vapor Pressure: Not available.

Vapor Density: Not available.

Evaporation Rate: Not available.

Viscosity: Not available.

Boiling Point: 2408 deg F

Freezing/Melting Point: 680 deg F

Decomposition Temperature: Not available.

Autoignition Temperature: Not applicable.

Flash Point: Not applicable.

NFPA Rating: (estimated) Health: 3; Flammability: 0; Reactivity: 1

Explosion Limits, Lower: Not available.

Upper: Not available.

Solubility: Soluble in water

Specific Gravity/Density: 2.04

Molecular Formula: KOH

Molecular Weight: 56.1047

Section 10 - Stability and Reactivity

Chemical Stability: Stable. Readily absorbs carbon dioxide and moisture from the air and deliquesces.

Conditions to Avoid: Incompatible materials, moisture, contact with water, acids, metals.

Incompatibilities with Other Materials: Generates large amounts of heat when in contact with water and may steam and splatter. Reacts with chlorine dioxide, nitrobenzene, nitromethane, nitrogen trichloride, peroxidized tetrahydrofuran, 2,4,6-trinitrotoluene, bromoform+ crown ethers, acids alcohols, sugars, germanium cyclopentadiene, maleic dicarbide. Corrosive to metals such as aluminum, tin, and zinc to cause formation of flammable

hydrogen gas.

Hazardous Decomposition Products: Oxides of potassium.

Hazardous Polymerization: Has not been reported.

69004382-4

Section 11 - Toxicological Information

RTECS#:

CAS# 1310-58-3: TT2100000

LD50/LC50:

CAS# 1310-58-3:

Oral, rat: LD50 = 273 mg/kg;

Carcinogenicity:

CAS# 1310-58-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: No information reported.

Reproductive Effects: No data available.

Neurotoxicity: No data available.

Mutagenicity: No data available.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Not available.

Environmental Fate: No information found.

Physical/Chemical: No information found.

Other: Not available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: None listed.

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	POTASSIUM HYDROXIDE, SOLID				POTASSIUM HYDROXIDE
Hazard Class:	8				8(9.2)
UN Number:	UN1813				UN1813
Packing Group:	II				II

Section 15 - Regulatory Information

US FEDERAL**TSCA**

CAS# 1310-58-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA**Section 302 (RQ)**

CAS# 1310-58-3: final RQ = 1000 pounds (454 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 1310-58-3: acute, reactive.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

CAS# 1310-58-3 is listed as a Hazardous Substance under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 1310-58-3 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

C

Risk Phrases:

R 22 Harmful if swallowed. R 35 Causes severe burns.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S 36/37/39 Wear suitable protective clothing, gloves and eye/face protection. S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 1310-58-3: 1

Canada

CAS# 1310-58-3 is listed on Canada's DSL/NDL List.

This product has a WHMIS classification of D1B, E.

CAS# 1310-58-3 is not listed on Canada's Ingredient Disclosure List.

Exposure Limits

CAS# 1310-58-3: OEL-AUSTRALIA:TWA 2 mg/m3 OEL-BELGIUM:STEL 2 mg/m3
OEL-DENMARK:TWA 2 mg/m3 OEL-FINLAND:TWA 2 mg/m3 OEL-FRANCE:STEL 2 m
g/m3 OEL-JAPAN:STEL 2 mg/m3 OEL-THE NETHERLANDS:TWA 2 mg/m3 OEL-SWI
TZERLAND:TWA 2 mg/m3 OEL-UNITED KINGDOM:TWA 2 mg/m3;STEL 2 mg/m3 OEL
IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEAL
AND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 6/21/1999

Revision #3 Date: 10/06/2000

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SODIUM BORATE, TETRA

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SODIUM BORATE, TETRA
SODIUM BORATE, TETRA

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MATERIAL SAFETY DATA SHEET

PRPP
ADJUDICAMENT CONTROLFISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100EMERGENCY CONTACTS
GASTON L. PILLORI
(201) 796-7100DATE 10/28/87
PO NBR: N/A
ACCT: 151046-08
INDEX: 13862580076
CAT NO: S248500

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SUBSTANCE IDENTIFICATION

SUBSTANCE: **SODIUM BORATE, TETRA**

CAS-NUMBER 1303-96-4

REC

NOV

TRADE NAMES/SYNONYMS:

BORAX; SODIUM DIBORATE; SODIUM TETRABORATE; BORAX DECAHYDRATE; BORICIN;
ANTIPYONIN; NEOBOR; BORASCU; GERTLEY BORATE; POLYBOR; SODIUM BIBORATE;
POLYBOR; SODIUM METABORATE; SODIUM BORATE; S-248; S-249; S-252; ACC21010CHEMICAL FAMILY:
INORGANIC SALTMOLECULAR FORMULA: $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ MOL WT: 381.42

CERCLA RATINGS (SCALE 0-3): HEALTH=2 FIRE=0 REACTIVITY=0 PERSISTENCE=0

COMPONENTS AND CONTAMINANTS

COMPONENT: SODIUM BORATE, TETRA

PERCENT: 100

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:
5 MG/MS ACGIH TWA

PHYSICAL DATA

DESCRIPTION: ODORLESS WHITE POWDER OR CRYSTALS

MELTING POINT: 167 F (75 C) $\cdot 8\text{H}_2\text{O}$ SPECIFIC GRAVITY: 1.73 PH: 9.5

SOLUBILITY IN WATER: 6.3%

SOLVENT SOLUBILITY: GLYCEROL; INSOLUBLE IN ALCOHOL

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SODIUM BORATE, TETRA

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FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
SLIGHT FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

FLASH POINT: NON-COMBUSTIBLE

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR ALCOHOL FOAM
(1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM
(1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).

FIREFIGHTING:
NO ACUTE HAZARD. MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. AVOID BREATHING
VAPORS OR DUSTS; KEEP UPWIND.

TOXICITY

1000 MG/KG ORAL-INFANT LDLO; 709 MG/KG ORAL-MAN LDLO; 2660 MG/KG ORAL-RAT
LD50; 2000 MG/KG ORAL-MOUSE LD50; 3 G/KG ORAL-DOG LDLO; MUTAGENIC DATA (RTEC);
CARCINOGEN STATUS: NONE.
BORATE POISONING AFFECTS THE KIDNEYS.

HEALTH EFFECTS AND FIRST AID

INHALATION:
IRRITANT.

ACUTE EXPOSURE- BORATES ARE IRRITATING TO THE MUCOUS MEMBRANES. ABSORPTION
THROUGH THE MUCOUS MEMBRANES MAY RESULT IN TOXIC EFFECTS: SKIN
EXCORIATIONS, FEVER, AND ANURIA.

CHRONIC EXPOSURE- PROLONGED ABSORPTION OF THE SUBSTANCE MAY CAUSE ANOREXIA,
WEIGHT LOSS, VOMITING, MILD DIARRHEA, SKIN RASH, ALOPECIA, CONVULSIONS,
AND ANEMIA.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING
HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. KEEP AFFECTED PERSON WARM AND
AT REST. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:
IRRITANT.

ACUTE EXPOSURE- BORATES ARE READILY ABSORBED THROUGH DAMAGED, ABRADED, AND
BURNED SKIN OR OPEN WOUNDS AND AREAS OF ACTIVE DERMATITIS. THEY MAY CAUSE
SYSTEMIC EFFECTS OF SKIN EXCORIATIONS, FEVER AND ANURIA.

CHRONIC EXPOSURE- PROLONGED ABSORPTION OF BORATES MAY CAUSE ANOREXIA,
WEIGHT LOSS, VOMITING, MILD DIARRHEA, SKIN RASH, ALOPECIA, CONVULSIONS AND
ANEMIA.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED
AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER (APPROXIMATELY

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15-20 MINUTES) UNTIL NO EVIDENCE OF CHEMICAL REMAINS. GET MEDICAL ATTENTION. **SODIUM BORATE, TETRA** PAGE 03 OF 04

EYE CONTACT:
IRRITANT.

ACUTE EXPOSURE- CONTACT MAY CAUSE REDNESS, PAIN, AND IRRITATION.
CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT MAY CAUSE CONJUNCTIVITIS.

FIRST AID: WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING THE UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 10-20 MINUTES). GET MEDICAL ATTENTION.

INGESTION:

ACUTE EXPOSURE- INGESTION MAY CAUSE VOMITING AND DIARRHEA OF MUCOUS AND BLOOD; ERYTHRODERMA FOLLOWED BY DESQUAMATION, EXCORIATIONS, BLISTERING, AND SLOUGHING OF EPIDERMAS; LETHARGY; TWITCHING OF FACIAL MUSCLES AND EXTREMITIES, FOLLOWED BY CONVULSIONS; HYPERPYREXIA, JAUNDICE, AND KIDNEY DAMAGE WITH OLIGURIA AND/OR ANURIA. CYANOSIS, HYPOTENSION, COLLAPSE, COMA, AND DEATH. THE FATAL DOSE MAY BE IN THE RANGE OF 5 TO OVER 30 GRAMS.

FIRST AID- IF VICTIM IS CONSCIOUS, IMMEDIATELY GIVE 2 TO 4 GLASSES OF WATER, AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT. GET MEDICAL ATTENTION IMMEDIATELY.

REACTIVITY

REACTIVITY:
STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

INCOMPATIBILITIES:
NONE KNOWN.

DECOMPOSITION:
MAY RELEASE TOXIC FUMES OF SODIUM OXIDE, WHICH CAN REACT WITH WATER OR STEAM.

POLYMERIZATION:
HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

CONDITIONS TO AVOID

— MAY BURN BUT DOES NOT IGNITE READILY. PREVENT DISPERSION OF DUST IN THE ATMOSPHERE. PROTECT CONTAINER FROM PHYSICAL DAMAGE. DO NOT STORE WITH INCOMPATIBLE SUBSTANCES.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
— WITH A CLEAN SHOVEL, PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND COVER. MOVE CONTAINERS AWAY FROM SPILL AREA.

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PROTECTIVE EQUIPMENT

VENTILATION:

PROVIDE LOCAL EXHAUST VENTILATION AND/OR GENERAL DILUTION VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR:

50 MG/M3- DUST/MIST RESPIRATOR.

500 MG/M3- GAS MASK WITH PARTICULATE FILTER, OR EQUIVALENT RESPIRATOR.

CLOTHING:

EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:

EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:

EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE.

WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHALL PROVIDE AN EYE-WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED - FISHER SCIENTIFIC GROUP, INC.
CREATION DATE: 02/12/85. REVISION DATE: 04/23/85

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SECTION I PRODUCT IDENTIFICATION

PRODUCT NAME: CALCIUM HYDROXIDE HYDRATED LIME

MSDS #: P16782V

DATE ISSUED: 1/1/02

SUPERSEDES: 4/6/98

ISSUED BY: 003744

HMIS RATINGS HEALTH 2 FLAMMABILITY 0 INSTABILITY 0 PROTECTIVE EQUIP: E

CAS NO: 1305-62-0

SECTION II INGREDIENTS

MATERIALS	%	TLV	PEL	CAS No
Calcium hydroxide, slaked lime		5mg/m3	5 mg/m3	(see above)

Calcium hydroxide is not listed on the NTP, IARC, or OSHA list of Carcinogens. The vendor recommends using personal protection equipment When handling this product.

SECTION III PHYSICAL / CHEMICAL DATA

BOILING POINT (calcium oxide): 5162 F

SPECIFIC GRAVITY (H2O=1): 2.2

Vapor Pressure (mm Hg): NA

MELTING POINT: 1076 F

Vapor Density (Air = 1): NA

Evaporation Rate: NA

SOLUBILITY IN WATER: 0.185% at 0 C, 0.077% at 100 C

APPEARANCE AND ODOR: White powder, Odorless

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NA

FLAMMABLE LIMITS: NA

EXTINGUISHING MEDIA: NA

SPECIAL FIRE FIGHTING PROCEDURES: NA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NA

SECTION V REACTIVITY DATA

STABILITY: Stable

CONDITIONS TO AVOID: NA

INCOMPATIBILITY: Acids, fluorine

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION VI HEALTH HAZARD DATA

Health Hazard - Acute: Corrosive to skin and eyes. Causes irritation and inflammation to mucous membrane and respirator passages.

Health Hazard - Chronic: NA

CARCINOGENICITY	IARC	NTP	OSHA
Calcium Hydroxide	No	No	No

SIGNS & SYMPTOMS OF OVEREXPOSURE:

Irritation of skin, eyes & respiratory tract.

Medical Conditions Generally Aggravated by Exposure: Respiratory disease
Skin condition.

EMERGENCY AND FIRST AID PROCEDURES:

Remove to fresh air. Wash skin with soap and water. Flush out eyes with generous amounts of water. Drink plenty of water if swallowed.
See physician.

SECTION VII PRECAUTIONS FOR SAFE HANDLING

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Normal clean-up procedures. Care should be taken to avoid causing dust to become airborne. Vacuum cleaning systems are recommended.

WASTE DISPOSAL METHOD: Dispose of in accordance with Federal, State and local regulations.

PRECAUTIONS TO BE TAKEN IN HANDLING:

Store away from incompatible substances.

Other Precautions: None

SECTION VIII CONTROL MEASURES

RESPIRATORY PROTECTION: Dust filter mask is recommended as minimal protection.

Ventilation: Local Exhaust - To maintain TLV's and PEL's
Mechanical - To maintain TLV's and PEL's
Special: None
Other: None

PROTECTIVE GLOVES: Cloth or leather gloves will protect skin

EYE PROTECTION: Fitted goggles will reduce eye injury.

OTHER PROTECTIVE CLOTHING: Long sleeve shirts and pants

WORK/HYGIENIC PRACTICES:

maintain dust exposure limits below TLV'S and PEL'S. If not possible then use respiratory protection.

SECTION IX REGULATORY COMPLIANCE

Listed on the US EPA TSCA inventory and is not regulated as a hazardous material by the Department of Transportation.

----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR

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* * * E N D O F M S D S * * *

Material Safety Data Sheet

Methanol

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OCT 09 2002

ACC# 14280

Section 1 - Chemical Product and Company Identification

MSDS Name: Methanol

Catalog Numbers: S75959, S75965, S75965A, S75965HPLC, S75965SPEC, A408-1, A408-4, A408SK-4, A411-20, A411-4, A412-1, A412-20, A412-200, A412-4, A412-500, A412200LC, A41220LC, A4124LC, A412500, A412500002, A412500LC, A412CU1300, A412FB115, A412FB19, A412FB200, A412FB50, A412J500, A412P-4, A412P4LC, A412POP19, A412POP200, A412POP50, A412POPB19, A412POPB200, A412POPB50, A412RB115, A412RB19, A412RB200, A412RB50, A412RS115, A412RS200, A412RS28, A412RS50, A412SK-4, A412SS-115, A412SS-200, A412SS19, A413-20, A413-200, A413-4, A413-500, A433F-1GAL, A433P-4, A433S-20, A433S-200, A433S-4, A434-20, A450-4, A452-1, A452-4, A452-4LC, A452-J1, A4524LC, A452J1, A452NB219, A452POP19, A452POP200, A452POP28, A452POP50, A452POPN19, A452RS19, A452RS200, A452RS28, A452RS50, A452SK-1, A452SK-4, A452SS-115, A452SS-200, A452SS-50, A452SS19, A453-1, A453-500, A453-500-003, A4531LC, A453J1, A454-1, A454-1LC, A454-4, A454-4LC, A454-RS115, A454-RS19, A454-RS200, A454-RS28, A454-RS50, A4541LC, A4544LC, A454POP19, A454POP200, A454POP50, A454RS115, A454RS19, A454RS200, A454RS28, A454RS50, A454SS-28, A454SS-50, A454SS19, A4551, A455POP19, A455POP200, A455POP50, A455SS19, A455SS200, A455SS50, A457-4, A935-4, A935FB200, A935POPB200, A936-1, A936-4, A947-4, A947-4LC, A947-RS115, A947-RS200, A947-RS28, A947-SS115, A947-SS200, A947-SS28, A947-SS50, A9474LC, A947POP19, A947POP200, A947POP50, A947SS19, BP1105-1, BP1105-4, BP1105POP19, BP1105POP20, BP1105POP50, BP1105SS19, BP1105SS28, BP2618100, HC400 1GAL, NC9633361, NC9766429, NC9780216, NC9905242, NC9941388, NC9942270, NC9964975, S586016, S58604, S58654, SC95-1, SW2-1, TIA9474, TIA947P200L, XXA411PD20LI, XXXA452RE19

Synonyms: Carbinol; Methyl Alcohol; Methyl hydroxide; Monohydroxymethane; Pyroxylic spirit; Wood alcohol; Wood naphtha; Wood spirit; Monohydroxymethane; Methyl hydrate.

Company Identification:

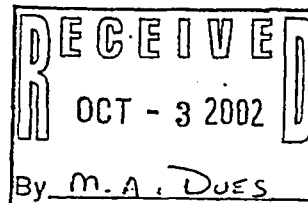
Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887



Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
67-56-1	Methanol	>99.0	200-659-6

Hazard Symbols: T F

Risk Phrases: 11 23/24/25 39/23/24/25

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: clear, colorless liquid. **Flash Point:** 11 deg C. **Poison!** Cannot be made non-poisonous. Causes eye and skin irritation. May be absorbed through intact skin. This substance has caused adverse reproductive and fetal effects in animals. **Danger! Flammable liquid and vapor.** Harmful if inhaled. May be fatal or cause blindness if swallowed. May cause central nervous system depression. Causes respiratory tract irritation. May cause liver, kidney and heart damage.

Target Organs: Kidneys, heart, central nervous system, liver, eyes.

Potential Health Effects

Eye: Produces irritation, characterized by a burning sensation, redness, tearing, inflammation, and possible corneal injury. May cause painful sensitization to light.

Skin: Causes moderate skin irritation. May be absorbed through the skin in harmful amounts. Prolonged and/or

repeated contact may cause defatting of the skin and dermatitis.

Ingestion: May be fatal or cause blindness if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause cardiopulmonary system effects.

Inhalation: Harmful if inhaled. May cause adverse central nervous system effects including headache, convulsions, and possible death. May cause visual impairment and possible permanent blindness. Causes irritation of the mucous membrane.

Chronic: Prolonged or repeated skin contact may cause dermatitis. Chronic inhalation and ingestion may cause effects similar to those of acute inhalation and ingestion. Chronic exposure may cause reproductive disorders and teratogenic effects. Laboratory experiments have resulted in mutagenic effects. Prolonged exposure may cause liver, kidney, and heart damage.

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.

Skin: Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical aid if irritation develops or persists. Wash clothing before reuse.

Ingestion: If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately. Induce vomiting by giving one teaspoon of Syrup of Ipecac.

Inhalation: Get medical aid immediately. Remove from exposure to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.

Notes to Physician: Effects may be delayed. Ethanol may inhibit methanol metabolism.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Water runoff can cause environmental damage. Dike and collect water used to fight fire. Vapors can travel to a source of ignition and flash back. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Vapors may be heavier than air. They can spread along the ground and collect in low or confined areas. May be ignited by heat, sparks, and flame.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed containers. Water may be ineffective. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water.

Flash Point: 11 deg C (51.80 deg F)

Autoignition Temperature: 464 deg C (867.20 deg F)

Explosion Limits, Lower: 6.0 vol %

Upper: 36.00 vol %

NFPA Rating: (estimated) Health: 1; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Use water spray to disperse the gas/vapor. Remove all sources of ignition. Provide ventilation. A vapor suppressing foam may be used to reduce vapors. Water spray may reduce vapor but may not prevent ignition in closed spaces.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep container tightly closed. Do not ingest or inhale. Do not

pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame. Avoid breathing vapor or mist.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Keep containers tightly closed. Do not store in aluminium or lead containers.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use only under a chemical fume hood.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Methanol	200 ppm TWA; 250 ppm STEL; skin - potential for cutaneous absorption	200 ppm TWA; 260 mg/m3 TWA 6000 ppm IDLH	200 ppm TWA; 260 mg/m3 TWA

OSHA Vacated PELs: Methanol: 200 ppm TWA; 260 mg/m3 TWA; 250 ppm STEL; 325 mg/m3 STEL

Personal Protective Equipment

Eyes: Wear chemical goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 51910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: clear, colorless

Odor: alcohol-like - weak odor

pH: Not available.

Vapor Pressure: 128 mm Hg @ 20 deg C

Vapor Density: 1.11 (Air=1)

Evaporation Rate: 5.2 (Ether=1)

Viscosity: 0.55 cP 20 deg C

Boiling Point: 64.7 deg C @ 760.00mm Hg

Freezing/Melting Point: -98 deg C

Decomposition Temperature: Not available.

Solubility: miscible

Specific Gravity/Density: .7910g/cm3

Molecular Formula: CH4O

Molecular Weight: 32.04

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: High temperatures, ignition sources.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, isocyanates, aliphatic amines, caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide).

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, formaldehyde.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 67-56-1: PC1400000

LD50/LC50:

CAS# 67-56-1:

Draize test, rabbit, eye: 40 mg Moderate;

Draize test, rabbit, eye: 100 mg/24H Moderate;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, rat: LC50 = 64000 ppm/4H;

Oral, mouse: LD50 = 7300 mg/kg;

Oral, rabbit: LD50 = 14200 mg/kg;

Oral, rat: LD50 = 5628 mg/kg;

Skin, rabbit: LD50 = 15800 mg/kg;

Carcinogenicity:

CAS# 67-56-1: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: Effects on Newborn: Behavioral, Oral, rat: TDLo=7500 mg/kg (female 17-19 days after conception).

Effects on Embryo or Fetus: Fetotoxicity, Inhalation, rat: TCLo=10000 ppm/7H (female 7-15 days after conception).

Specific Developmental Abnormalities: Cardiovascular, Musculoskeletal, Urogenital, Inhalation, rat: TCLo=20000 ppm/7H (7-14 days after conception).

Reproductive Effects: Paternal Effects: Spermatogenesis: Intraperitoneal, mouse TDLo=5 g/kg (male 5 days pre-mating). Fertility: Oral, rat: TDLo = 35295 mg/kg (female 1-15 days after conception). Paternal Effects: Testes, Epididymis, Sperm duct: Oral, rat: TDLo = 200 ppm/20H (male 78 weeks pre-mating).

Neurotoxicity: ACGIH cites neuropathy, vision and CNS under TLV basis.

Mutagenicity: DNA inhibition: Human Lymphocyte = 300 mmol/L. DNA damage: Oral, rat = 10 umol/kg. Mutation in microorganisms: Mouse Lymphocyte = 7900 mg/L. Cytogenetic analysis: Oral, mouse = 1 gm/kg.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: 29.4 g/L; 96 Hr; LC50 (unspecified) Goldfish: 250 ppm; 11 Hr; resulted in death Rainbow trout: 8000 mg/L; 48 Hr; LC50 (unspecified) Rainbow trout: LC50 = 13-68 mg/L; 96 Hr.; 12 degrees C Fathead Minnow: LC50 = 29400 mg/L; 96 Hr.; 25 degrees C, pH 7.63 Rainbow trout: LC50 = 8000 mg/L; 48 Hr.; Unspecified ria: Phytobacterium phosphoreum: EC50 = 51,000-320,000 mg/L; 30 minutes; Microtox test No data available.

Environmental: Dangerous to aquatic life in high concentrations. Aquatic toxicity rating: TLM 96>1000 ppm. May be dangerous if it enters water intakes. Methyl alcohol is expected to biodegrade in soil and water very rapidly. This product will show high soil mobility and will be degraded from the ambient atmosphere by the reaction with photochemically produced hydroxyl radicals with an estimated half-life of 17.8 days. Bioconcentration factor for fish (golden ide) < 10. Based on a log Kow of -0.77, the BCF value for methanol can be estimated to be 0.2.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 67-56-1: waste number U154; (Ignitable waste).

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	METHANOL				METHANOL
Hazard Class:	3				3(6.1)
UN Number:	UN1230				UN1230
Packing Group:	II				II
Additional Info:					FLASHPOINT 11 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 67-56-1 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

Section 302 (RQ)

CAS# 67-56-1: final RQ = 5000 pounds (2270 kg)

Section 302 (TPQ)

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 67-56-1: acute, flammable.

Section 313

This material contains Methanol (CAS# 67-56-1, 99.0%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

CAS# 67-56-1 is listed as a hazardous air pollutant (HAP). This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 67-56-1 can be found on the following state right to know lists: California, New Jersey, Florida, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

T F

Risk Phrases:

R 11 Highly flammable.

R 23/24/25 Toxic by inhalation, In contact with skin and if swallowed.

R 39/23/24/25 Toxic : danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 36/37 Wear suitable protective clothing and gloves.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S 7 Keep container tightly closed.

WGK (Water Danger/Protection)

CAS# 67-56-1: 1

Canada - DSL/NDSL

CAS# 67-56-1 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D1A, D2B.

Canadian Ingredient Disclosure List

CAS# 67-56-1 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 67-56-1: OEL-ARAB Republic of Egypt:TWA 200 ppm (260 mg/m3);Skin OEL-AUSTRALIA:TWA 200 ppm (260 mg/m3);STEL 250 ppm;Skin OEL-BELGIUM:TWA 200 ppm (262 mg/m3);STEL 250 ppm;Skin OEL-CZECHOSLOVAKIA:TWA 100 mg/m3;STEL 500 mg/m3 OEL-DENMARK:TWA 200 ppm (260 mg/m3);Skin OEL-FINLAND:TWA 200 ppm (260 mg/m3);STEL 250 ppm;Skin OEL-FRANCE:TWA 200 ppm (260 mg/m3);STEL 1000 ppm (1300 mg/m3) OEL-GERMANY:TWA 200 ppm (260 mg/m3);Skin OEL-HUNGARY:TWA 50 mg/m3;STEL 100 mg/m3;Skin OEL-JAPAN:TWA 200 ppm (260 mg/m3);Skin OEL-THE NETHERLANDS:TWA 200 ppm (260 mg/m3);Skin OEL-THE PHILIPPINES:TWA 200 ppm (260 mg/m3) OEL-POLAND:TWA 100 mg/m3 OEL-RUSSIA:TWA 200 ppm;STEL 5 mg/m3;Skin OEL-SWEDEN:TWA 200 ppm (250 mg/m3);STEL 250 ppm (350 mg/m3);Skin OEL-SWITZERLAND:TWA 200 ppm (260 mg/m3);STEL 400 ppm;Skin OEL-THAILAND:TWA 200 ppm (260 mg/m3) OEL-TURKEY:TWA 200 ppm (260 mg/m3) OEL-UNITED KINGDOM:TWA 200 ppm (260 mg/m3);STEL 250 ppm;Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 7/21/1999

Revision #10 Date: 8/02/2002

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.

MATERIAL SAFETY DATA SHEET
NEUTRON PRODUCTS INC.

Revised March 31, 1989

I. PRODUCT IDENTIFICATION

Product Name: Photafloc-1132

Chemical Name: Cationic copolymer of acrylamide and a quaternized comonomer

Chemical Formula: $-(CH_2-CH)_{CO}-(CH_2-CH)_{COOR_1N^+(R_2R_3R_4)Cl^-}$ CAS NO. 69418-26-4

Appearance: Photafloc 1132 is a mildly acidic, water soluble, high molecular weight polymer in the form of a gel log. It varies in color from water white to slightly yellow and has a mild, slightly sweet odor.

II. HAZARD SPECIFICATIONS

Product Hazard: The polymer gel and its solutions are nonhazardous.

Hazardous Ingredients: The polymer gel contains a small amount of unreacted acrylamide monomer, CAS 79-06-1, (0.1 - 0.3%), which has an OSHA-PEL (permissible exposure limit) of 0.03 mg/m³. The American Council of Governmental Hygienists recommends a TLV-TWA (threshold value limit; 8 hour time weighted average) of 0.03 mg/m³, A2, skin. This acrylamide monomer level will not normally be reached when handling the polymer gel or its solutions. Also present is a small amount of unreacted cationic comonomer.

NFPA Hazard Rating:

Health -	0	minimal
Flammability -	0	minimal
Reactivity -	0	minimal
Special -	0	minimal

III. PHYSICAL HAZARDS

Flammability: The polymer gel and its solutions are nonflammable, noncombustible, and nonexplosive. No special fire extinguishing methods are needed.

Stability: The product is stable and compatible with aqueous systems. It has no hazardous decomposition products. Combustion products are carbon monoxide, carbon dioxide, ammonia, nitrogen oxides, and water.

Spillage: The spilled product solution and wet gel logs are very slippery. Use caution to avoid injury when handling. Follow cleanup and disposal methods listed in Section VI.

Irritation: Overexposure may result in the following:

Eyes: May cause mild eye irritation.

Skin: May cause irritation and dermatitis.

Ingestion: May cause irritation of the mouth and throat, nausea, and vomiting.

NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road • P.O. Box 68 • Dickerson, Maryland 20842 USA
301-349-5001 • FAX: 301-349-2433

Emergency and First Aid Procedures:

Eyes: Flush gently with water for at least 15 minutes. Contact physician.

Skin: Wash with soap and running water. Remove contaminated clothing and wash before reuse.

Ingestion: Drink a large quantity of liquid to dilute the product. Induce vomiting. Call a physician.

Special Handling Requirements: Gloves should be worn when handling gel logs, polymer solutions, and surfaces contacted by them. Safety glasses are recommended. Product should be handled in ventilated areas. No special respiratory protection is required. Skid prevention methods should be employed in wet areas.

IV. TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: $>100^{\circ}\text{C}$ (212°F)

Freezing Point: $<-17^{\circ}\text{C}$ (1°F)

Vapor Pressure @ 10°C : Not determined

Vapor Density: Not determined

% Volatile (vol): Negligible at 70°F

Water Solubility: Infinite

Specific Gravity: 1.09 - 1.15

pH of 1% Solution: 4-6

Evaporation Rate: Slower than butyl acetate

V. HEALTH HAZARD INFORMATION

Medical conditions generally recognized as aggravated by exposure: None

Primary route of entry: If standard industrial hygiene and recommended procedure are followed, entry of the product or listed ingredients is not expected.

Product: Photafloc 1132 is not listed as a carcinogen by the NTP, not regulated by OSHA, and not evaluated by IARC. No human effects are known for the polymer.

Ingredients: Acrylamide, present as a residual monomer, has been given an A2 notation "suspected of carcinogenic potential for man," by the ACGIH. Symptoms reported in humans, due to excessive exposure to acrylamide monomer, generally thought to be due to skin absorption, include: fatigue, difficulty climbing stairs, weakness in hands and feet, tremors, ataxia, loss of deep tendon reflexes, numbness in the feet, tingling or cold sensations, and increased sensitivity to touch, all of which occur early. Secondary muscle atrophy, particularly in hands and feet, and weight loss, occur later. Urinary retention may occur. Central nervous system effects, which may occur, are abnormal sleepiness, poor memory, confusion, hallucinations, slurred speech,

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hyperactive reflexes, abnormal behavior, positive Romberg sign, abnormal EEG, and changes in visual fields. Recovery can occur, but can take months to years. Increased sweating and erythema of the hands is reported as being characteristic; peeling of the skin of the palms has occurred.

VI. SPILL AND LEAK PROCEDURES

Polymer Gel: Avoid getting gel wet, as it becomes slippery and makes surfaces it contacts slippery. Sweep up or collect gel pieces, using gloves, and reuse or dispose of in accordance with local, state, and Federal regulations. The product is not listed in Federal hazardous waste regulations 40 CFR 261.33, Paragraphs (e) and (f). It does not exhibit any of the hazardous characteristics listed in 40 CFR 261, Subpart C.

Polymer Solutions: Contacted surfaces are slippery. Rinse with large amounts of water until slickness can no longer be detected. If extensive rinsing is impractical, apply an absorbant material, such as sawdust, and discard as a solid waste. Areas that remain slick can be treated with household bleach (aqueous sodium hypochlorite) and washed.

VII. CONTROL MEASURES

Appropriate Hygienic Practices: Avoid breathing mist. Do not allow eye or skin contact. Wash thoroughly after handling. Remove and wash contaminated clothing. Avoid contamination of food, beverages, or smoking materials.

Protective Equipment: Impervious gloves; safety glasses or goggles.

Work Practices: Keep work areas clean and dry. Surfaces subject to spills can become slippery.

Handling and Storage: Store in a cool, dry, well-ventilated area.

Engineering Controls: Provide adequate ventilation. Install antiskid devices on steps and potentially slippery areas.

Manufacturer Data

Neutron Products, Inc.
22301 Mt. Ephraim Road
Dickerson, Maryland 20842

Contacts: Joannes C. Tang, Jeffrey D. Williams

Inquiry Telephone Number: 301/349-5001

NEUTRON PRODUCTS Inc

22301 Mt. Ephraim Road • P. O. Box 68 • Dickerson, Maryland 20842 USA
301-349-5001 • FAX: 301-349-2433

MSDS**Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 800-858-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-896-6644

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-562-2537) for assistance.

FLUORESCEIN USP

MSDS Number: F3042 --- *Effective Date: 11/02/01*

1. Product Identification

Synonyms: Spiro[isobenzofuran-1(3H),9'-(9H)xanthen]-3-one, 3',6'-dihydroxy-;
Fluorescein USP; CI Acid Yellow 73; Soap Yellow; CI 45350
CAS No.: 2321-07-5
Molecular Weight: 332.32
Chemical Formula: C₂₀H₁₂O₅
M422, M423

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Fluorescein	2321-07-5	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! MAY CAUSE ALLERGIC SKIN OR RESPIRATORY REACTION.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 1 - Slight
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:

May cause allergic reaction in sensitive individuals.

Ingestion:

May cause allergic reaction in sensitive individuals.

Skin Contact:

May cause allergic reaction in sensitive individuals.

Eye Contact:

May cause allergic reaction in sensitive individuals.

Chronic Exposure:

Chronic exposures may cause allergic reaction.

Aggravation of Pre-existing Conditions:

No information found.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion:

If large amounts were swallowed, give water to drink and get medical advice.

Skin Contact:

Immediately flush skin with plenty of soap and water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard.

Explosion:

Not considered to be an explosion hazard.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

None established.

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Yellowish-red to red powder.

Odor:

No information found.

Solubility:

Insoluble in water.

Specific Gravity:

No information found.

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

No information found.

Melting Point:

314 - 316C (597 - 601F) Decomposes.

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Strong oxidizers.

Conditions to Avoid:

Incompatibles.

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

Investigated as a mutagen.

-----\Cancer Lists\-----

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Fluorescein (2321-07-5)	No	No	None

12. Ecological Information

Environmental Fate:

No information found.

Environmental Toxicity:

No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----				
Ingredient	TSCA	EC	Japan	Australia
Fluorescein (2321-07-5)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----				
Ingredient	Korea	--Canada--		Phil.
		DSL	NDSL	
Fluorescein (2321-07-5)	Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\-----				
Ingredient	-SARA 302-		-----SARA 313-----	
	RQ	TPQ	List	Chemical Catg.
Fluorescein (2321-07-5)	No	No	No	No

-----\Federal, State & International Regulations - Part 2\-----				
---	--	--	--	--

Ingredient

CERCLA

-RCRA-

-TSCA-

261.33

8 (d)

Fluorescein (2321-07-5)

No

No

No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: No information found.

Poison Schedule: No information found.

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 1 Flammability: 1 Reactivity: 0

Label Hazard Warning:

WARNING! MAY CAUSE ALLERGIC SKIN OR RESPIRATORY REACTION.

Label Precautions:

Do not breathe dust.

Keep container closed.

Use only with adequate ventilation.

Avoid prolonged or repeated contact with skin.

Wash thoroughly after handling.

Label First Aid:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If large amounts were swallowed, give water to drink and get medical advice. In case of skin contact, immediately flush skin with plenty of soap and water. Remove contaminated clothing and shoes. Wash clothing before reuse. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

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FROM USE OF OR RELIANCE UPON THIS INFORMATION.

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MATERIAL SAFETY DATA SHEET

EnviroLogic-Spillaway, Wyncote, Pa 19095

EMERGENCY PHONE: (215) 887-4400

INFORMATION: (215) 887-4400

SECTION I - IDENTIFICATION

PRODUCT: FleetKleen™

DESCRIPTION: BIO-REMEDIAL CLEANER-DEGREASER

SECTION II - INGREDIENTS & HAZARDOUS CLASSIFICATION

HAZARDOUS COMPONENTS: NONE

TYPICAL COMPOSITION: AN AQUEOUS-WATER BASED SOLUTION OF SINGLE-CELLED MICRO-ORGANISMS IN A SOLUTION OF MICRONUTRIENTS, EXTRACTS & BIO-SURFACTANTS WITH NATURAL FOOD COLOR ADDED FOR IDENTIFICATION.

SARA HAZARD: TITLE III SECTION 313: NOT LISTED FIRE-[SECTION 311/312]: NONE NOTED

SECTION III - HEALTH INFORMATION

EFFECTS OF OVEREXPOSURE:

INHALATION: NO KNOWN PROBLEM

INGESTION: MAY CAUSE MILD TRANSIENT GASTROINTESTINAL IRRITATION.

EYE CONTACT: MAY CAUSE MILD TRANSIENT IRRITATION. NOT CLASSIFIED.

SKIN CONTACT: NOT CLASSIFIED AS AN SKIN IRRITANT OR CORROSIVE MATERIAL

SECTION IV - OCCUPATIONAL EXPOSURE LIMITS

PEL: NO OSHA PEL

TLV: NO ACGIH TLV

SECTION V - EMERGENCY FIRST AID PROCEDURE

FOLLOW STANDARD FIRST AID PROCEDURES:

SWALLOWING: CALL PHYSICIAN OR POISON CONTROL CENTER.

SKIN CONTACT: WASH AFFECTED AREA WITH WATER.

EYE CONTACT: FLUSH EYES WITH COOL WATER FOR AT LEAST 15 MINUTES.

INHALATION: REMOVE VICTIM TO FRESH AIR

SECTION VI - PHYSICAL DATA

BOILING POINT: 212° F.

MELTING POINT: N/A

VAPOR PRESSURE: MM/HG: <0.01 @ 20° C.

SPECIFIC GRAVITY: H₂O=1 1.00 +/-0.01

SOLUBILITY IN WATER: COMPLETE

APPEARANCE: LIQUID

ODOR: MILD CITRUS

COLOR: LIGHT ORANGE

pH: 6.9 to 7.2

SECTION VII - FIRE & EXPLOSION HAZARDS

FLASH POINT & METHOD USED: N/A
FLAMMABLE LIMITS: N/A
NFPA RATING: NO NFPA RATING

HMIS RATING: HEALTH: 0 FIRE: 0 REACTIVITY: 0

SPECIAL FIRE FIGHTING PROCEDURES & PRECAUTIONS: NONE
UNUSUAL FIRE & EXPLOSION HAZARDS: NONE

SECTION VIII - REACTIVITY

STABILITY: STABLE
HAZARDOUS POLYMERIZATION: NONE
MATERIALS TO AVOID: STRONG OXIDIZING AGENTS & STRONG ACIDS
HAZARDOUS DECOMPOSITION PRODUCTS: NONE
CONDITIONS TO AVOID: DO NOT QUICK FREEZE OR EXPOSE TO TEMPERATURES OVER 150° F..
THESE TEMPERATURES POSE NO HAZARD BUT THEY ARE NOT COMPATIBLE
WITH THIS PRODUCT.

SECTION XI - EMPLOYEE PROTECTION

CONTROL MEASURES: ADEQUATE VENTILATION
RESPIRATORY PROTECTION: NONE REQUIRED
PROTECTIVE CLOTHING: NONE REQUIRED
EYE PROTECTION: NONE REQUIRED, BUT RECOMMENDED

SECTION X - ENVIRONMENTAL PROTECTION

ENVIRONMENTAL PROTECTION: NONE. THIS PRODUCT IS ENVIRONMENTALLY SAFE EVEN WHEN
LARGE QUANTITIES ARE RELEASED INTO THE ENVIRONMENT.
SPILL OR LEAK PRECAUTIONS: NONE
WASTE DISPOSAL: MAY BE DISPOSED OF IN NORMAL WASTE STREAM ACCORDING TO
FEDERAL, STATE OR LOCAL REQUIREMENTS

SECTION XI - REGULATORY CONTROLS

DOT CLASSIFICATION: CLASS 55
DOT PROPER SHIPPING NAME: CLEANING COMPOUNDS
OTHER REGULATORY REQUIREMENTS: NONE

SECTION XII - PRECAUTIONS: HANDLING, STORAGE & USAGE

ALTHOUGH THERE ARE NO SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING, STORAGE OR USAGE OF THIS PRODUCT THAT
WILL CHANGE ITS SAFE USE, IT IS RECOMMENDED THAT IT BE KEPT AT A TEMPERATURE BETWEEN 32° F. & 120° F. IN ORDER
FOR IT TO BE MOST EFFECTIVE.

SECTION XIII - DATE & STATEMENT

THIS INFORMATION RELATES ONLY TO THE SPECIFIC MATERIAL DESIGNATED & MAY NOT BE VALID FOR SUCH MATERIAL USED
IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY OTHER PROCESS. THE STATED M.S.D.S. IS RELIABLE TO THE BEST
OF THE COMPANY'S KNOWLEDGE & BELIEVED TO BE ACCURATE AS OF THE DATE INDICATED. HOWEVER, NO
REPRESENTATION, WARRANTY OR GUARANTEE OF ANY KIND, EXPRESSED OR IMPLIED, IS MADE AS TO ITS ACCURACY,
RELIABILITY OR COMPLETENESS & WE ASSUME NO RESPONSIBILITY FOR ANY LOSS, DAMAGE OR EXPENSE, DIRECT OR
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SUITABLENESS & COMPLETENESS OF SUCH INFORMATION FOR HIS OR HER OWN PARTICULAR USE.

EnviroLogic-SpillAway
827 Glenside Ave.
Wyncote, PA 19428 PHONE: (215) 887-4400

REVISION DATE: 3/1/2002

PREPARED BY: MARK WEINBERG, VICE PRES.